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International Health

1. Introductory Remarks *

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RECOGNITION of the promotion of public health as an international responsibility may be traced back to the 14th century when certain primitive quarantine regulations were taken for Adriatic ports. The first international sanitary conference was held in Paris in 1851, with special reference to quarantine in the Mediterranean and Black Sea areas, and the first international sanitary convention of any real value was signed in 1892.

It was only in 1902, however, that the First International Sanitary Conference of American Republics at its meeting in Washington established the Pan American Sanitary Bureau, the first permanent organization created for multilateral international action in the field of public health—but covering only the two American continents.

Seven years later, in 1909, the International Office of Public Health was set up with its headquarters in Paris with a world-wide scope, and including 46 countries in its membership.

The Pan American Sanitary Bureau, in its earlier days, and the Paris Office throughout its career, laid emphasis primarily on quarantine regulations designed to prevent the transfer of communicable diseases from one area to another with minimum handicaps on international trade, but without reference to health conditions within each country itself. This was a useful but a negative function. The more modern concept of an international health program which involves coöperation in building up within each nation of the world of a sound and effective program of disease control and health promotion was first demonstrated by an organization which was neither international nor national, but representative of the vision of a private social service organization—the Rockefeller Foundation. In the year 1913, it established an International Health Commission which, under various names, has functioned for nearly 40 years and has played a major role in the development of coöperative action in this field.

Ten years later, in 1923, the League of Nations established its Health Organization and for the first time created

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really effective machinery for a continuing attack on the problems of disease on a world-wide scale. The central body responsible for the health program was the Health Committee, composed of 12 members, plus certain "expert assessors" appointed as individuals by the League itself. From 1923 on, the United States, though not a member of the League, was always represented on the Health Committee. Numerous technical subcommittees on such subjects as malaria, cancer, and housing were appointed. Under the Health Committee (but administratively subject to the Secretary General of the League) was the secretariat, including the Director of the Health Section, a small staff of experts, and the necessary clerical staff. The accomplishments of the Health Organization were of major importance until the Second World War ended its activities.

In the basic field of vital statistics the League organized at Geneva a Service of Epidemiological Intelligence which collected data on the prevalence and movement of communicable diseases and distributed the information widely. At Singapore, in the heart of one of the most acute epidemic zones, it established a Far Eastern Bureau from which the most recent data on such diseases as cholera and plague were broadcast (to the scandal of conservative health authorities) weekly or daily, so that the news of infection at a given port could be picked up by ships at sea and by planes in flight. The Epidemiological Intelligence Service of the League covered 80 per cent of the world's population; and the Singapore Bureau alone received regular reports from 180 seaports.

In more technical fields of coördination of health knowledge, the work of the Commission on Biological Standardization was of particular importance. A sound policy was developed which involved formulation of the basic terms of a given problem by the world's best qualified authorities, calling together of an international group of experts for preliminary discussion, conduct in various countries of necessary experiments and comparative tests, and preparation of a multinational report on standard terms and procedures. In this way, 27 different standards for antitoxic serums, organic extracts (thyroid, sex hormones, and so forth), vitamins, and various preparations used in medicine were adopted; and international standard preparations for comparison were made available at national laboratories in England and Denmark, acting for the League of Nations.

Of equal significance was the contribution of the League in the field of nutrition. Beginning with a report on "The Food of Japan" and a survey of nutrition in Chile requested by the government of that country, the Health Section made a report in 1935 on the nutritional requirements of the human organism, which has been the basis of our nutritional program throughout the world.

The Malaria Commission of the League succeeded in harmonizing widely divergent schools of thought into a sound and accepted program for the prevention and treatment of malaria, the greatest of all microbic enemies of the human race. Similar constructive approaches yielded important results in the fields of tuberculosis, syphilis, rabies, leprosy, infant mortality, cancer, and sleeping sickness in equatorial Africa.

The League studies on rural hygiene, on housing, on the health of the school child, and on physical education extended its influence into the fields of health promotion. In particular, the Commission on Housing has had a far-reaching influence in developing standards of home design and construction compatible with the maximum of physiological, psychological, and social health.

In the field of direct service to individual nations, the Health Organization

rendered invaluable aid in the control of postwar typhus in Poland and malaria in Greece; in the development of a health program for China; in reform of health administration in Czechoslovakia; in improvement of sanitary conditions in Bolivia; in syphilis control in Bulgaria; in anti-cholera measures in Shanghai; in malaria control in Albania, Yugoslavia, and Siam; in typhus control in Rumania; and in reduction of infant mortality in Belgium, France, and The Netherlands.

When the conference which made plans for a new international organization to replace the League of Nations was held in this city of San Francisco in 1945, the delegations of Brazil and China introduced a resolution for the calling of a special conference to establish an independent international health organization. We sometimes think that progress in the field of international cooperation must proceed very slowly. It is of interest, therefore, to note that only five months after the United Nations was actually organized (in January, 1946) a preliminary International Conference was held in New York at which a constitution for a World Health Organization was drawn up in admirably broad terms. The necessary 26 national signatures for the formal establishment of the WHO were not obtained until April, 1948; but the 1946 New York Conference set up an Interim Commission which functioned effectively during the two intervening years, meeting its first major challenge in the prompt control of an epidemic of cholera in Egypt in 1947. The responsibilities of the International Office of Public Health and of the Health Organization of the League of Nations were formally turned over to the WHO and the Pan American Sanitary Bureau became its regional organization for the Americas.

The Constitution of the WHO is a remarkable document in its breadth and vision. In this Constitution health was defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"; and it was stated that "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."

These broad statements were later amplified by specific mention under the functions of the organization that it is "to promote maternal and child health and welfare and to foster the ability to live harmoniously in a changing total environment"; "to foster activities in the field of mental health, especially those affecting the harmony of human relations"; "to promote, in coöperation with other specialized agencies where necessary, the improvement of nutrition, housing, sanitation, recreation, economic or working conditions, and other aspects of environmental hygiene" and ". . . the prevention of accidental injuries"; and "to study and report on . . . administrative and social techniques affecting public health and medical care from preventive and curative points of view, including hospital services and social security." The specific inclusion of mental hygiene, nutrition, housing, accident prevention, and medical care represents a sound and constructive vision of the public health of the future which is substantially in advance of the actual practice of most health departments of the United States.

The WHO is "to act as the directing and coördinating authority on international health work" and "to establish and maintain such administrative and technical services as may be required, including epidemiological and statistical services"; and "to propose conventions, agreements and regulations, and make recommendations with respect to international health matters."

Furthermore, the WHO is not limited

to over-all standardizing and coördinating activities. It may also render direct service to individual nations or areas, being empowered: "to assist governments, upon request, in strengthening health services; to furnish appropriate technical assistance and, in emergencies, necessary aid upon the request or acceptance of governments; to provide or assist in providing, upon the request of the United Nations, health services and facilities to special groups, such as the peoples of trust territories."

Finally, the WHO is empowered "to promote and conduct research in the field of health"; "to promote improved standards of teaching and training the health, medical and related professions"; and "to provide information, counsel and assistance in the field of health"—in other words, to enter the vast field of public health education.

It would be difficult to imagine wider or more comprehensive sailing orders.

The World Health Organization has its headquarters in the beautiful and commodious Palais des Nations built by the League of Nations, looking across Lac Leman to the white peak of Mt. Blanc. It is governed by a World Health Assembly which meets annually and which includes theoretically representatives of 79 nations. I say "theoretically" because nine Iron Curtain countries and China do not at present attend its sessions. The WHO Constitution—wisely in my judgment—makes no provision for withdrawal from its comity of nations. The erring brothers have their seats waiting for them when they desire to mend their ways. The Assembly elects 18 member states, in groups of six each year, each to designate a technically qualified person as a member of the Executive Board to serve for three years; and this Executive Board meets twice a year to carry out the general policies of the Organization, and to formulate recommendations to the Assembly on future policies.

The organization of the Secretariat of the World Health Organization includes first of all, in the Office of the Director-General, two divisions, one on Coordination of Planning and Liaison which is responsible for the vital coördination of activities with the UN, its other specialized agencies and a considerable number of coöperating nongovernmental organizations; and another on Public Information, responsible for securing for WHO the coöperation of a well informed public in all nations.

Next, there are three major departments, of Administration and Finance, of Central Technical Services, and of Advisory Services. The Department of Administration and Finance includes functions such as Management, Personnel, Conference Services, General Services, Budget and Legal Matters, and assists the Director-General in the administration of the Organization as a whole.

The Department of Central Technical Services is, in general, charged with the over-all activities which the WHO took over from the League of Nations and which offer to all nations the basic facts and the basic standards on which wise policies must be based. It assists National Health Administrations in a number of specialties and is, in addition: 1. responsible for administering the Sanitary Conventions governing all land, air, and sea traffic and for operating a world-wide "intelligence service" for the detection of outbreaks of epidemic diseases; 2. helping countries to increase the quantity of their health statistics and to improve the quality of their statistical systems (e.g. preparation of the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*); 3. establishing standards for the purity and potency of important drugs (e.g. publication of the first *International Pharmacopoeia;* 55 Biological Substances standardized so far); 4. acting as a clearing house for

information and research on a great number of infectious and parasitic diseases; 5. issuing a number of periodicals to keep national administrations informed of developments in public health.

These are broad and comprehensive services available for all countries alike. The Department of Advisory Services deals more directly with individual nations and with more specific problems of health protection and health promotion. It collects and collates information from different regions so that experience gained (and mistakes made) in one area may be profitable to another. It provides Regional Organizations and Member States with up-to-date information as to the best techniques of public health practice in various fields. It offers direct counsel on specific health programs to assist each area in attaining maximum efficiency at minimum cost. It aids the regional offices in recruiting adequate professional personnel and in procuring essential supplies.

In this Division, the WHO has top-flight experts from various countries in such fields as malaria, tuberculosis, venereal diseases, maternal and child health, mental hygiene, nutrition, public health administration, nursing, public health education, and environmental sanitation.

Finally, there are six Regional Offices, for the Americas, Southeast Asia, the Eastern Mediterranean, Africa, Europe, and the Western Pacific, which the Central Office at Geneva serves and through which its ultimate objectives will be actually accomplished.

The general scale of the WHO program may be gauged by the 1950 budget and its distribution (in round numbers).

The sum indicated below may be compared with the budgets of $250,000 available to the Health Organization of the League of Nations and $50,000 available to the Paris Office:

Advisory Services	$2,700,000
Central Technical Services	1,200,000
Central Administration and Finance	800,000
Common Services	500,000
Regional Offices	500,000
Meetings	200,000
Expert Committees	200,000
	$6,100,000

It is not dollars which ultimately count but the men and women who spend them. In closing these introductory remarks, let me add one personal note. I had the rare privilege last spring of spending two months at Geneva as a special consultant to the WHO and my job involved primarily the securing of advice and assistance in the shaping of a report which I had been invited to prepare. I spent hours in conference with almost every outstanding member of the Advisory Service and Technical Service staffs. Never in my life have I come in contact with such an able group of experts in the various technical specialties of public health. Never have I seen men and women in any organization so well knit together, so wholly coöperative, so dedicated to a common task. In the days of the League I heard the comment that "There is more true religion in the secretariat of the League of Nations than in all the churches of Geneva." That goes for the WHO sccretariat today.

The main credit for this achievement must be given to Dr. Brock Chisholm, who has guided the destinies of the Interim Commission and of the WHO for more than five years. He is no heavy-handed executive. As a true psychiatrist, he moves like the Deity in mysterious ways his wonders to perform. But he performs them; and he has molded at Geneva a weapon of great and living power for the attainment of the objectives of world health.

International Health

2. The Role of WHO, Past, Present, and Future * †

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WHO inherits the responsibility of carrying on and developing further the work done in more than a hundred years of international coöperation in the control of disease. Among these inherited responsibilities, from the Health Section of the League of Nations, the *Office International d'Hygiène Publique*, and the United Nations Relief and Rehabilitation Administration, are epidemiological notification services, biological standardization, medical aspects of narcotics control, and many others.

The International Health Conference, which adopted the Constitution of the World Health Organization in 1946, added extensively to the fields of work in which previous agencies had functioned. Health is defined in much wider terms than ever before and WHO given responsibilities *never before laid on an international health agency.*

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

"The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.

"The health of all peoples is fundamental to the attainment of peace and security and is dependent upon the fullest coöperation of individuals and states.

"The achievement of any state in the promotion and protection of health is of value to all.

"Unequal development in different countries in the promotion of health and control of disease, especially communicable disease, is a common danger.

"Healthy development of the child is of basic importance; the ability to live harmoniously in a changing total environment is essential to such development.

"The extension to all peoples of the benefits of medical, psychological and related knowledge is essential to the fullest attainment of health.

"Informed opinion and active coöperation on the part of the public are of the utmost importance in the improvement of the health of the people."

While national sovereignties are protected completely, a new principle of international law, introduced into the Constitution, will make health regulations adopted by the World Health Assembly far more effective than previous international conventions. The 79 nations which have signed the Constitution have agreed to be bound by such regulations, unless they "contract out," by notifying WHO within a specified time of reservations or of their intention not to accept regulations and the submitting a statement of their reasons for not accepting. The long, slow, and usually never completed process of ratification by each government of an international convention is thus avoided. WHO is not a "supranational" health agency but stands ready to help, in whatever ways are most useful, each nation to take the next appropriate steps in the development of

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the health services available to its people.

At the present time much money is being spent internationally on health; it comes from many sources and is expended through a variety of channels. Among such sources and channels are: the United Nations International Children's Emergency Fund; United Nations Expanded Program for Technical Assistance to Underdeveloped Countries; United Nations Food and Agriculture Organization; United Nations Educational, Scientific and Cultural Organization; the Technical Assistance Program of the United States of America (Mr. Truman's Point IV); the British Commonwealth Technical Assistance Plan (the Colombo Plan); the CARE Organization of the U. S. A.; national and religious relief and welfare organizations; the International Committee of the Red Cross; the League of Red Cross Societies, and many others. The nations of the world have given WHO great responsibility in relation to all these activities. The first stated function of WHO is "to act as *the* directing and coördinating authority on international health work." More and more this coördinating function is occupying the attention and the resources of WHO.

The very vastness of the field and the multiplicity of approaches indicate the complexity of the problems facing WHO. These are not only technical problems but also social and political. Merely to import technical equipment and knowledge into less developed countries from more developed ones may seem very simple, but that is only one small aspect of the total job. Certain conditions tend to prevent effective transplantation of health techniques—such conditions as unstable government, obsolete land tenure systems, nepotism, insecurity of tenure of civil servants, political appointments to technical positions, ignorance, sacred cows of many colors, shapes, and sizes and under many names, poverty, low productivity, graft and corruption, irresponsibility in using international relationships for internal political purposes, excessive nationalism, excessive birth rates, and extensive misrepresentation of facts and of motives.

There is no country that I know of which is entirely free of all these problems—and *these* are the main problems in all international work, including international health. Many of them are very important barriers. One might hope that no country would seriously misrepresent its own way of life to the world in such a way as to damage its own reputation and to embarrass its friends, but that happens. Let me give you an example:

The major source of information about the American way of life in many countries is American moving pictures. What these movies tell the rest of the world is of the greatest conceivable importance, and not only to America. Certain governments are buying all the American gangster movies they can get with their slender stocks of American dollars, because these movies are the best possible propaganda against western democracy, because they are entirely convincing to the many millions of relatively naive people who see them and who then believe that Americans spend their time huddled in doorways while gangster automobiles roar down the streets spraying bullets from tommy guns.

This is only an example of the sort of difficulty which adversely affects international relations and tends to prevent effective exchanges of constructive and progressive ideas. There are of course many others, but this particular one happens to be *your* responsibility lying squarely in the lap of the people of this country. No other country in the world so seriously and so effectively misinforms the other nations about its own way of life. One gangster movie can undo much of the good work of Voice

of America programs. Is this good business, to put it on no higher an ethical level?

The problems of food supply and living space are of course of major importance in many parts of the world and cannot safely be ignored by anyone. Some governments are beginning to recognize their greatest danger in their own birth rates; others still refuse to face this uncomfortable reality. For instance, a simple choice faces the Government of India, effective birth control measures immediately, or mass starvation and death for millions. Will anyone dare to suggest that India should *choose* death?

Perhaps these are enough examples of the problems of international work, though it would be possible to go on for hours with appropriate illustrations. I hope they will serve to indicate that no international organization, no matter how technical, can confine its interests to narrow fields. A team approach to every situation is necessary, but a team of organizations is powerless without the active backing and participation of the peoples of the world.

The WHO, like the other specialized agencies, and the United Nations itself, has no entity of its own. It is no more than the embodied intention and will of the peoples of its 79 member governments. The UN, WHO, and all the rest will do what the national delegations of their member governments tell them to do. The national delegations can only express the will of their governments. Governments can only represent their people, finally, although they may misrepresent them for some time.

The responsibility for what is done, or is not done, in the world rests on individual citizens as never before! Informed public opinion is absolutely essential to the carrying of that responsibility. The election of intelligent, educated legislators in every country, capable of functioning as citizens of the world, is the next necessary step toward world peace and security. *This only the people can do!*

In the meantime, the UN and the specialized agencies have been founded on a hope—but only a hope—that enough people in the cities, towns, villages, and rural areas of the world will attain a sufficient stage of maturity soon enough to save the greatest and most hopeful experiment ever formulated by the human race—and, incidentally—to save the race itself from destruction.

No one of us who is capable of thinking freely can ever again dissociate himself from this frame of reference—the welfare of the human race. We must learn to break down our own barriers of nationalism, of local interest, of prejudice, of fancied superiority. We must not insist that our ways are right and best for other peoples. Some of them may be, but we are not the ones to decide that. We can only help people to take the next steps along the pathway of their own development, and we must not hurry them too much lest we make more troubles than we cure. We may hope that, with some assistance, their development may be more orderly, more humane, and faster than ours has been, and we may also hope to learn much ourselves from them.

We must learn to understand peoples struggling with their own destiny, and understanding does not imply agreement with attitudes that are historically inevitable at particular stages of social development. Once when I was indicating a certain degree of impatience with social development in a communist country, A Russian made a remark that I have remembered. He said, "You know, Dr. Chisholm, you would also have some difficulties if you had to live intimately *even with your own great grandparents.*"

It is salutary to remind ourselves that all our ancestors have passed through stages of absolute certainties, absolute

orthodoxies, extreme nationalism, absolute ruthlessness, and absolute intolerance. Many peoples in the world are only now coming out of the Middle Ages, where such were standard attitudes. Not what we tell them will affect their course of development, but how we live in our own communities and how patient and wise and strong we may show ourselves to be. Our greatest responsibility is right in our own homes—what happens there will determine what governments do and the fate of nations.

From these sketchy comments and from what my colleagues say tonight, it will be clear to you that anything like complete implementation of the terms of reference of WHO contained in its Constitution is still far in the future; but sane and fairly well balanced progress is being made in many directions, all calculated to contribute toward "the attainment by all peoples of the highest possible level of health," the stated objective of the nations of the world.

Division of Occupational Health

As part of a comprehensive program for additional protection of the health of workers, the U. S. Public Health Service has renamed its Division of Industrial Hygiene. Now called the Division of Occupational Health, it will deal with "all problems affecting the health of workers," not solely with occupational health hazards. One of its early new concerns will be the investigation of health hazards in the handling of radioactive materials and radiation-producing processes. These are currently being employed in a great variety of industrial establishments, both large and small.

The division is preparing to make intensive studies of the health requirements of special occupational groups, such as earlier studies on silicosis, which have resulted in substantial control of that disease. Seward E. Miller, M.D., is chief of the division.

International Health

3. Some Aspects of the WHO's Programs in the Americas *

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THE six WHO Regions: the Western Pacific, the Southeast Asian, the Eastern Mediterranean, the European, the African and the American, vary widely in those climatic, ethnic, political, religious, cultural, economic, and epidemiological factors which influence the nature of regional health problems and the development of national health services, and determine the ease of international collaboration.

The 22 nations and the almost equally numerous territories of the Americas have a common cultural heritage from a small section of Western Europe and have none of the deep-seated racial, religious, ideological, and territorial dissensions which make international collaboration so difficult in some of the Regions.

There is a long tradition of sanitary collaboration by the American Republics, antedating even the First Pan American Sanitary Conference (1902).

The habit of inter-American collaboration for health has grown and developed during the past half century through:

1. Pan American Sanitary Conferences, and Conferences of National Directors of Health,
2. The active participation of the PASB and the International Health Division of the Rockefeller Foundation in programs for the eradication of plague and yellow fever,
3. The participation of the PASB, the Rockefeller Foundation, and, since 1942, the Institute of Inter-American Affairs in national health programs,
4. The development of a high degree of unity in public health culture, based on an extensive fellowship program during the past three decades.

The first foreign fellows at the School of Hygiene of Johns Hopkins University in 1918 were two Brazilians, Dr. Geraldo de Paula Souza and Dr. Borges Vieiera, both of whom devoted the remaining 30 years of their lives to the development of the Faculty of Hygiene of the University of São Paulo. These were but the forerunners of hundreds of fellows from all over the Americas in the schools of public health in the United States and Canada.

One of the most important aspects of the WHO program in the Americas is that, since May, 1949, the Pan American Sanitary Bureau has been serving as the Regional Office of the World Health Organization. Only in the field of health have the specialized agencies of the United Nations and of the Organization of American States joined hands in a single administrative organization. This may be due, at least in part, to the fact that the World Health Organization, and the older Pan American Bureau, were both created by treaties separate from those of the political organizations with which each is affiliated, and neither is, as was the Health Section of the League of Nations, the technical section of a political organization.

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The alliance of the World Health Organization and the PASB has resulted in active collaboration of the European areas of the Americas in regional activities. The membership coverage by the two organizations is almost complete, only Colombia not taking part in the WHO and only Canada not participating in the PASO.

With the coördination of the WHO-PASB programs, the provision of the WHO Charter for separate regional assessments for programs which cannot be financed from headquarters funds has, in fact, become operative. Only in the Americas are nations paying a double assessment, one to the World Health Organization and the other to the Regional Agency. The PASB-WHO combination operates very close to the pattern established by the WHO, except that the regional activities are carried out under the Pan American Sanitary Code rather than under the Charter of the WHO. But even the funds from this double assessment available for the combined WHO - PASB operations throughout the Americas in 1951 amount to only $2,300,000, an amount entirely inadequate to the needs and opportunities of the Region.

A basic principle of the Regional Office is that its every activity should contribute to the development of the national and local health services within the country concerned, and should preferably result in a permanent increase in the budgets of these official services. Another basic principle is that no program, not justified by the potential economic and social conditions of the district serviced, should be developed.

The Bureau insists on maintaining direct contact with the health authorities of individual countries on all technical policies and programs.

In stimulating the development of health projects in a country, the Regional Office is committed to the ultimate objective of the development of general health services with well rounded programs. Such general services require a highly trained staff of various categories which cannot, under any circumstances, be magically produced from one year to the next. In the meantime, there are a number of serious, specific problems which can be solved by personnel with a short period of intensive training in the application of a single technique. The importance of such problems as malaria, yaws, yellow fever and even venereal diseases, for which relatively simple and economical solutions are now available, justifies the organization of special campaigns without awaiting the development of general health services. The Regional Office has special interest in such campaigns when they involve the interests of more than one country. Such special campaigns are particularly important when they lead to the possibility of vector or disease eradication.

There are in the Americas a number of exotic and indigenous diseases, which are limited in extent, but which are either spreading or are potentially dangerous to areas not yet infected. Among these should be mentioned onchocercosis, hydatidosis, schistosomiasis and bartonellosis. The Regional Office feels a very special responsibility for these diseases and is on the alert for opportunities to aid in studies of measures for their control and possible eradication.

The Bureau has become involved in the organization and, to a certain extent, in the administration of regional associations such as the Inter-American Hospital Association, the Inter-American Association of Sanitary Engineering, and the most regularly active of all, the U. S. - Mexico Border Public Health Association, which will hold its Tenth Annual Meeting next spring in Monterrey, Mexico.

In addition to the regular fellowship programs of the WHO-PASB, special field projects for intensive training have been developed in serology, nutrition,

the control of rabies and venereal diseases, and the use of BCG. Special workshops for nursing supervisors and for public health statisticians, and institutes for hospital administrators have been held with excellent results.

The PASB-WHO is collaborating in such internal projects as the reorganization of health services; the organization of health demonstration areas and health centers, with special emphasis on maternal and child health; programs for the eradication of yaws and for the control of venereal diseases, tuberculosis, typhus, plague, malaria, insect-transmitted diseases in general, and hookworm disease; and immunization campaigns for diphtheria and pertussis and for the application of BCG.

In addition, there are zonal projects, involving collaboration with two or more countries, and continental projects, involving collaboration with several nations in North, Central, and South America. Zonal projects are being developed for the control of rabies, typhus, hydatidosis, venereal diseases, plague and insect-transmitted diseases in general, and for studies in nutrition.

Continental programs are related to yellow fever and smallpox vaccination, to aftosa (foot and mouth disease), and to the eradication of the *Aëdes aegypti* mosquito.

The Institute of Nutrition of Central America and Panama represents a unique effort in international collaboration in field and laboratory investigation of a very complex problem. The Institute, originally proposed and in part financed by the Kellogg Foundation, has demonstrated the possibility of the financial and technical collaboration of a number of countries in a common project of interest to all, which would have been difficult for any country alone to support.

The Pan American Sanitary Bureau is collaborating with the Governments of Brazil and Colombia in the maintenance of the Yellow Fever Laboratories in Rio de Janeiro and Bogotá, which give pathological, serological, and diagnostic services and supply yellow fever vaccine for use throughout Latin America.

A somewhat unusual project for an international health organization is the Pan American Aftosa Center for research, diagnosis, and teaching, founded in 1951 in collaboration with the Brazilian Government.

Of special interest are the two declared eradication programs, the one a local campaign for the eradication of yaws in Haiti, the other a well advanced continental program for the eradication of the *Aëdes aegypti* mosquito, the urban vector of yellow fever.

Should the yaws eradication project in Haiti be successful, it will surely lead to similar campaigns elsewhere and to the eventual eradication of yaws from the American tropics, just as the initial success in the eradication of *Aëdes aegypti* in Brazil and Bolivia led to the continent-wide program.

In 1947, when the proven distribution of jungle yellow fever in the Americas was still limited to South America, the Directing Council approved, on the proposal of Brazil, a program for the continental eradication of *Aëdes aegypti*. This action constitutes a landmark in international health, since it is the first official recognition by an international health organization of regional responsibility for the solution of a health problem involving an entire continent. During the intervening four years considerable progress has been registered in the eradication of *Aëdes aegypti* in practically all of the countries of South and Central America, in Mexico, and in some of the islands of the Caribbean.

The importance of the program for the eradication of *Aëdes aegypti* has been repeatedly shown this year in Ecuador and in Costa Rica, where outbreaks of jungle yellow fever have occurred very close to urban centers

only recently freed of *Aëdes aegypti.*

In the United States, the absence of yellow fever since 1905 has led to a complacency with regard to the *Aëdes aegypti* mosquito which, coupled with the division among the several states of the responsibility for its eradication, has led to a failure to organize an eradication program here.

While it cannot be claimed that the recent outbreaks of jungle yellow fever in Panama and Costa Rica appreciably increase the recognized threat of the introduction of yellow fever virus into the United States, it is essential, in order to prevent the reinfestation of other nations, as they are cleared of *Aëdes aegypti,* that eradication be done here. From the standpoint of national public health pride, the United States should be setting the pace in this first continental program instead of preparing to come in last. It will surely be of future advantage to the United States to have the principle of regional responsibility for eradication fully established through the precedent of the eradication of *Aëdes aegypti,* since the time must come when this country will desire to foment international programs for the eradication of various other insects and diseases, once these have been eradicated here.

I cannot conscientiously conclude these remarks on the work of the international health agencies in the Americas without reference to one aspect of the situation which, while not limited to the Americas, is probably more aggravated here than in other regions. I refer to the multiplicity of organizations which are operating in the international health field with funds drawn essentially from the same source as that of the WHO and PASB; namely, government contributions.

Notwithstanding the fact that the treaties creating the WHO and the PASB provide that these agencies shall be the coördinating agencies in international health for the member states, there are, leaving out of consideration the bilateral organizations, which operate on the basis of direct agreements between the donor and the recipient governments and are to be discussed by a later speaker, four different mechanisms by which United States funds, and funds from other countries, are made available for international health programs in the Americas; namely, the UNICEF, the Technical Assistance Council for Economic Development of the United Nations, the Technical Assistance Council of the Inter-American Economic and Social Council of the Organization of American States, and the Technical Assistance Administration of the United Nations. From the first three of these sources, there are available for programs in the Americas in 1951, for which the WHO-PASB gives the technical orientation and approval, approximately $2,700,000, or $400,000 more than the combined budgets for the WHO-PASB for the same period. The resultant programs are quite different from those which would have been developed had the same funds been available to the WHO-PASB under the guidance of the World Health Assembly and the Directing Council of the PASO.

Time does not permit a discussion of the varied mechanisms by which programs are requested by governments and approved for financing by the different funds. Suffice it to say that the World Health Assembly and the Directing Council of the PASO, the technical bodies established by treaty to approve policies and programs and vote budgets for international health work, have no voice in the greater part of the programs in operation and projected in the Americas.

The situation is not a satisfactory one from the standpoint of the WHO-PASB, nor from that of the receiving authorities, and it is certain that the present

situation cannot long continue without bringing into disrepute the entire system of international collaboration of the United Nations and of the Organization of American States. It would seem that this is a matter which might well be of more than academic interest to the professional public health associations of Member States and especially to the American Public Health Association.

More Communities Fluoridate Water

According to *Dental News* of the Public Health Service for September, 1951, cities that have recently started fluoridation of their water supplies include Fort Wayne, Ind., 140,000 population; Indianapolis, Ind., 480,000; and Huntingburg, Ind., 4,000. Indianapolis is said to be the largest city in the United States fluoridating its public water supply. It was also recently announced that the Washington Suburban Sanitary Commission, which includes Montgomery and Prince Georges Counties, Maryland, will begin fluoridation by March, 1952, benefiting some 300,000 persons.

At present, 121 cities in the United States fluoridate their water supplies. Another 138, including Baltimore, San Francisco, Louisville, Seattle, and Pittsburgh, have approved programs. Almost 12,000,000 people are involved in programs either in effect or approved. A list of cities currently using this preventive measure may be obtained from the Division of Dental Health, Public Health Service, Washington 25, D. C.

International Health

4. Application of WHO Programs and Policies in a Region *

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THE Southeast Asia Region of the World Health Organization comprises Afganistan, Burma, Ceylon, India, Indonesia, and Thailand. It contains nearly 500 million people—more than three times the population of the United States in three-fourths of that area. The population is very unevenly distributed, with some areas very heavily populated —such as the Ganges Valley and Java; but there are also large areas with very few people. More than 80 per cent of the people live in villages, 80 per cent are illiterate, and the average annual income is in the neighborhood of $50. All public health planning must start with these facts.

The average per capita expenditure on health is no more than 20 cents. Birth rates are high, varying from 25 to 40 per 1,000. Death rates vary between 15 and 20 per 1,000. The already vast population is steadily increasing, e.g., India shows an increase of 23 million and Ceylon an increase of nearly one million during the past five years. The expectation of life is very low, from 25 to 35 years. A large percentage of deaths take place during infancy and childhood. The infant mortality rate averages about 150 per 1,000 and goes up to over 300. Communicable diseases are a major feature of health conditions. Smallpox, plague, cholera, typhoid, and dysentery still claim an enormous number of victims every year. Malaria is rampant throughout the region and claims over 100 million cases, with more than one million deaths every year. Tuberculosis is extremely common. While no reliable statistics are available, it has been estimated that in India alone there are two and one-half million cases, with half a million deaths every year. Another three-fourths of a million cases are estimated for Java and Madura, and so on—for other countries. The quantitative aspect of the health problems therefore presents a staggering picture. Poverty, hunger, and disease are arrayed in force against the people.

Health services are extremely weak, although they have increased recently. There are neither the financial resources nor the trained technical personnel to give the bare elements of health care to this vast population. The number of medical personnel, of all types, is woefully inadequate. For example, in Afghanistan there are 100 doctors for 16 million people. The population per doctor varies from 12,000 to 120,000; there is one midwife for anything up to 100,000 population. There is one public health officer for one million persons. There is one hospital bed for 3,000 persons. Chronic poverty and malnutrition have sapped the desire for improvement, although the rising tide of nationalism has reawakened the hopes of the people.

Having stated very briefly the background against which we have to work,

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I will give a brief picture of the work of the World Health Organization in this area. The Constitution of WHO provides for decentralization through the establishment of regional offices. As you have, in this country, the widest experience of regional establishments in the field of health, I do not need to justify here the need for such peripheral control in preference to a highly centralized organization. While the central technical functions of WHO have been largely confined to its headquarters office, the operational functions have been completely decentralized to regional offices. Each Regional Office has its own Regional Committee, and the responsibility of framing national programs, in the light of local needs, rests entirely with these regional offices and Committees. This responsibility is of course discharged with due regard to the global program policy of the organization. In pursuance of this policy, the regional office in Southeast Asia was established in January, 1949.

There can be no quick and permanent solution to any of the major health problems of the region, and it would be dangerous, even if it were financially possible, for an international agency like ours to launch large-scale disease control operations which governments would be unable to maintain after outside assistance came to an end. We conceive our function as essentially to strengthen local and national health services, and to provide guidance in the sound development of national health programs. So far, we have confined our activities to a few well chosen fields, carefully avoiding dispersion of our limited resources.

We have concentrated on helping governments in the control of malaria, tuberculosis, and yaws, and in the field of maternal and child care. In all these programs, and also in the related field of nursing, emphasis has been laid on the training of local personnel. Training programs have been assisted by strengthening local medical and paramedical institutions, with international staff and imported equipment and supplies, as well as by fellowships.

On the basis of two and a half years experience, it is already clear that, even with our restricted means, we can successfully act as a catalytic agent, stimulating governments to increased efforts for the health of their people.

I will only give one or two examples. India has always been to the fore in malaria control, but before the participation of WHO, efforts had centered mainly around the industrial areas or other well populated malarious regions. Little attention was paid to large tracts of fertile land which had long remained uninhabited or sparsely populated on account of malaria. The results of WHO assistance in controlling malaria in four such areas, in the past two years, have been not only to create a public demand for further control measures, but also to arouse public consciousness to new possibilities of colonization of neglected areas, with a very substantial improvement in food supply.

In both Afghanistan and Thailand, the success of WHO malaria control projects in rural areas has stimulated the governments to further efforts on an unprecedented scale. The Afghan Government has now made provision for the extension of operations to seven new areas. In Thailand the government plans in 1952 to control malaria among an aggregate population of 1.4 million, including the 600,000 persons already protected in 1951, with WHO assistance. By 1953 it is hoped that a 2.5 million population will be protected.

In the field of tuberculosis, international assistance is being directed primarily to providing training facilities in modern methods of diagnosis and prevention. In Southeast Asia, an army of tuberculosis workers is needed, not a platoon. New training and demonstra-

tion centers, at present being opened with WHO assistance in almost all the countries of the region, are intended to point the way and to stimulate governments to concrete action on an adequate scale.

BCG vaccination, introduced into India and Ceylon by WHO in 1949, has made good progress. Of the four million persons tuberculin tested in India, almost two million were positive reactors, and of the remainder about one and one-half million have been vaccinated. Over 100 local BCG teams are working and more are being trained. The target set by the Indian Government for 1951–1952 is to have a total of six and one-half million persons tested.

Two years is too short a period for maternal and child health work to show results, but I should like to mention the work of the public health nurses attached to almost all the international teams. To combine public health nursing with malaria work, for instance, was a quite novel idea in this region. In one state where health services were poorly developed, the public health nurse attached to a malaria team began maternal and child health and health education work in a smallish area. Local interest was quickly aroused, and a local committee raised funds for a permanent clinic. The international team withdrew after its initial two years of operation but the maternal and child health work is being carried on by the local government alongside the malaria control and will be further developed as funds and staff become available. This is just one example among the many of the value of public health nurses in field work in the region.

Another success has been the anti-yaws campaign launched a year ago, with WHO and UNICEF assistance, in Thailand and Indonesia. In areas where previously the incidence of yaws was anything up to 20 per cent, the disease has so far been controlled among a population of over one million. This work is still going on.

All of this work has not been accomplished entirely within the financial resources of the organization. The WHO regular budget is very limited—in fact a mere eight to nine million dollars spread over 79 countries. The United Nations Technical Assistance funds have provided a valuable contribution to our capacity to help the underdeveloped countries of Southeast Asia. The UNICEF has also played a big role in the field of maternal and child health and in the control of malaria and tuberculosis. I should like to emphasize this close coöperation between WHO and UNICEF. More recently UNICEF has approved programs for local manufacture of some essential medical supplies without which our other efforts in Southeast Asia would be in vain. I refer particularly to the proposed establishment of plants for the production of insecticides and antibiotics.

Our regular funds provide for the Southeast Asia Region about $550,000, the United Nations Technical Assistance funds provide another $1,300,000, while the imported supplies and equipment, largely from UNICEF, should contribute $2,500,000. This total of about four and one-half million dollars is the measure of our assistance in this region. Adding to this the United States aid of approximately 10 million dollars means no more than two cents per capita per year.

In order to be able to receive our assistance, governments have to contribute matching costs for local personnel, supplies, buildings and equipment and maintenance costs, of more than equal value. For example, in the project for expanding the MCH department of the All India Institute of Hygiene and Public Health at Calcutta, the international costs and the government contribution are equal to about one million dollars on each side. In order

to receive about four million dollars worth of technical assistance from us, the governments of the Region have to spend at least five to six million dollars. In addition, governments give a guarantee for the future maintenance of the projects entirely at their own cost, as international assistance usually lasts only for the first two or three years of any given field project. The burden on governments in respect to local personnel, supplies and facilities, and maintenance is therefore very heavy and it goes to the credit of these countries that in spite of extremely limited budgetary resources and acute shortage of foreign currencies, they are shouldering these heavy financial commitments.

The two great difficulties in our work have been the lack of trained health personnel of all categories and the shortage of vital supplies and equipment, most of which have, of necessity, to be imported. While the training of personnel can be adequately assisted, the need for vital supplies and equipment remains largely unsolved. For example, we may train sufficient local staff to provide a malaria organization for a country within three to four years; but such training is of no use if the required quantity of insecticides is not available. We know again that if an artesian well could be provided in every village, thereby giving safe drinking water, the intestinal communicable diseases such as cholera, typhoid, and dysentery would be drastically reduced; but from where is the vast quantity of iron piping to come? In most cases the vital supplies have to be imported and the governments have neither the required financial resources nor the hard currencies required for such purchase. This is a big problem for the Southeast Asia countries. In the solution of this problem I think the people of the United States can play a major role, as this is the country where the bulk of the required supplies is produced.

It might be asked, "What are we going to do with the increased population that will result from improved health services?" The question of population control is receiving much greater attention in Southeast Asia today, and the taboos of the past seem to be disappearing. Where great populations live close to the margin of subsistence, any change in the economy, the culture, or the medical situation must have repercussions on population growth. Parallel development in education and social organization will reduce the risk of population growth through improved health. Family planning can play an important role, but much greater research is required to develop methods applicable and acceptable to the East. In this the United States of America can play a significant part owing to its extensive facilities for scientific investigation.

I have attempted to give you a bird's-eye view of our problems and our approach to these problems. The magnitude of the task is colossal but we have made a good beginning and, given adequate support, will continue to go forward with confidence.

International Health

5. Bilateral International Health Programs of the United States *

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THE story of the World Health Organization (WHO) presented by Dr. Chisholm and his colleagues is a truly great story, one still in its first chapter.

A significant part of the complete picture of international health falls outside the World Health Organization story. It is, however, so much the same thing, so intimately related and so vital to the ultimate triumph of the world health movement, that it is necessarily a part of these discussions. This is the story of the health programs that are being carried out jointly by two friendly countries working together for their common good and for the general good. Such programs differ from those of the World Health Organization in that they involve a direct bilateral relationship between the two governments concerned, rather than a multilateral international pooling of resources under common international direction Their story is an important one in the world today and one worth recounting.

We must view it with full understanding. We all believe, first and foremost, in the World Health Organization. We want to live, and want our children to live, in a world in which internationalism is a firm and established reality. That is our national policy; it constitutes Point I of President Truman's inaugural address, more renowned for its enunciation of the newer concept, Point IV.

We do not have such a world yet. We must keep building toward it. The WHO is part of it and, to us as health workers, the most vital part. But it is young and in a most troubled world for one so young. We, with our unique resources, our deep and abiding respect for man, and our fearsome world responsibility, must grasp every opportunity to build the kind of world in which the WHO can grow into splendid maturity.

The United States shares the belief expressed by the WHO that participation by any one nation to the extent of contributing beyond one-third of its basic budget would endanger the true and unfettered international character of the organization. Acceptance of this principle places, for the moment, certain limits on the organization which are determined by the ability of the least fortunate members, in a world of eccentric balance, to share in the common endeavor.

The United States is prepared to push beyond the present reach of the WHO and is doing so through its bilateral programs. Some of these programs were under way on a large scale when the WHO was born; others have been launched since then to meet specific urgent problems.

In carrying out its bilateral programs, the United States looks constantly to the WHO for leadership and guidance. It recognizes fully the coördinating authority given to WHO in its Constitution, to which the United States is a

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party. In Washington, each month, the responsible international health officials of the U. S. Public Health Service and of the Institute of Inter-American Affairs meet under the chairmanship of the Regional Director of the WHO, for the purpose of program development and coördination within this hemisphere. In Burma, Thailand, and other countries in Southeast Asia, coördinating committees, which include representatives of WHO and U. S. Public Health Service officers, have been established by the Ministries of Health at the national level.

The international health movement is in the most real sense a single unified movement pressing toward a common goal. It draws freely on the rich international experience of private foundations, voluntary organizations, universities, commercial firms, and church medical missions. Each program makes some contribution through its own experience to the developing art of international collaboration in health.

The story of United States bilateral coöperation in health begins in our own hemisphere, taking us back almost a decade. The Foreign Ministers of the American Republics, taking a broad look at the problems of all-out war, within a month of Pearl Harbor called for cooperation among the republics on health and sanitation programs. They requested this as a measure that would aid in mobilizing the resources of the hemisphere for war and for the peace that would follow. Promptly, the United States Office of the Coordinator of Inter-American Affairs launched a coöperative health program in 18 of the Latin American republics.

This program, born of emergency needs, has become a major component of the long-range economic and social development plans and hopes of the hemisphere. It has established administrative patterns and modes of action which demonstrate that two governments can work hand in hand on joint development programs. It has pioneered the Point IV trail.

This program has from the beginning had four chief areas of emphasis: the development of local health services through health centers; sanitation of the environment, with particular emphasis on water supply, sewage disposal, and insect control; the training and full-time employment of professional public health workers; and education of the public in health matters. It has stressed complete community health development under full-time trained direction, with active community participation.

During the nine years since 1942, some 2,820 distinct projects have been undertaken in this program; 474 projects are currently active. These projects have included operation of 121 health centers; construction of 201 water supply systems, 74 sewerage systems, and 342 other health facilities, such as hospitals, nursing schools, laboratories, markets, and public laundries. Underlying this has been a training program: 1,302 Latin American professional persons have been given advanced training in public health through fellowships; technical assistance and financial aid have been given to the Schools of Public Health in Mexico, Santiago, and São Paulo; and 240 local training courses have been given at subprofessional levels.

This program has been carried out through joint services established within the Ministry of Health of each coöperating government. This, the *Servicio Cooperativo,* which is an integral part of the host government, is headed by the Chief of Field Party of the Institute, who thus becomes an official of both governments, directing a program that is jointly determined and jointly financed. The effective application of this administrative device on a wide basis in intergovernmental technical coöperation is a singularly significant achievement.

Early in the program, the financial contributions of the United States to the joint *Servicio* funds were substantially larger than those contributed by the host governments. Now, in every case, the host governments have substantially increased their contributions both in the total and in the amount relative to the contributions made by the United States. Since the inception of the work in 1942, through the fiscal year 1951, the joint programs have amounted to a total of $102,178,000, with the United States contributing, in personal services and program funds, approximately 48 per cent of the total. In the fiscal year 1951 itself, the Institute paid a total of under $3,000,000, while the coöperating Latin American governments contributed a total of $13,287,000 to the *Servicio* funds. This is not in the remotest sense a give-away program. It is a truly coöperative effort to overcome problems that are of immediate concern to the entire hemisphere and to the world in which this hemisphere plays such a vital part.

Jumping the Atlantic, we find in 1944 the second United States bilateral health program, in Liberia, a country tied to us closely by history and important to our cause in the dangerous days of World War II. It is a country that today has only one physician of national origin and has all the health problems of a primitive tropical environment. There, at the request of the President of Liberia, the U. S. Public Health Service embarked in 1944 on a program of bilateral assistance which marks the entry of the Public Health Service into the bilateral phase of international health work, in which today it plays a most important role. This program is being expanded and serves as the nucleus for the first Point IV program to be established outside of the Americas.

This program has developed health services and medical care facilities for Monrovia, the capital city. It has controlled malaria in the area of the capital and has established the first, and as yet only, nursing school in the country. Very dramatically, it stamped out a nation-wide epidemic of smallpox. For months, United States physicians and nurses led teams of Liberian dressers and vaccinators into the jungle and bush of a country which in its 43,000 square miles has a mere 200 miles of road. Since 1946 smallpox has no longer been a public health problem in Liberia.

Of deeper significance, the annual health budget of Liberia has increased tenfold since the U. S. Public Health Service Mission set foot in Africa seven years ago.

A new and important element entered into the bilateral health story in 1947. That was the open recognition, as a basis for national action, of the fact that communism breeds on filth, disease, and human misery. Immediately after the enunciation of the Truman Doctrine of containment of communism, a Mission was sent to Greece. It contained an important health component composed of U. S. Public Health Service officers which subsequently became the public health division of the present Economic Cooperation Administration (ECA) Mission to Greece.

The program has been one of technical assistance and the provision of essential supplies. The work has been done by Greece, under Greek direction, with Greek funds meeting all internal expenses. This has been an extensive program. It has included the construction of 5 tuberculosis sanatoria, 3 nursing schools, 6 hospitals and 2 health centers, as well as aid to the Greek War Relief Association in the construction of 5 general hospitals and 11 health centers. Water supplies have been improved in 375 communities.

A far-reaching result of the Mission's work is its influence and assistance in the strengthening of the organization of

the national health service and, in particular, the establishment therein of sanitary engineering and nursing divisions.

The work of the public health group is recognized as one of the major factors in bringing a greater measure of economic and social stability to postwar Greece.

Today neighboring Turkey, which has seen this work in Greece, is host to a small, recently arrived ECA health mission.

With the conquest of China by the Communists and the outbreak of communistic guerilla activities in Southeast Asia, the ECA undertook to give assistance to these areas, with a view to quieting unrest. Applying its experience in Greece, it immediately undertook, with the technical assistance of the U. S. Public Health Service, to initiate health programs which would bring relief as rapidly as possible to the rural populations of the countries in this area.

In countries of Southeast Asia—Burma, Thailand, Vietnam, Cambodia, Laos, and Indonesia—and in the Philippines and Formosa, ECA is today spending some $22,000,000 to extend medical care and sanitation as rapidly as possible to the villages. Since these are highly malarious countries, much emphasis is being placed on initiating control programs, through both residual spraying and the distribution of chloroquine. In Vietnam, for example, some 114,000 houses have been sprayed within the last few months. In Thailand some 40,000 homes have been sprayed. Between 30,000 and 35,000 persons in Vietnam showing symptoms of malaria have been treated with chloroquine.

An aggressive attack is being made on trachoma and other eye infections in Burma, Vietnam, and Thailand, using the most modern techniques.

These and other extensive and intensive activities reaching directly into the villages are being directed by 80 U. S. Public Health Service officers.

The Point IV Program has already been mentioned. Its underlying concept is understood here, I am sure. It is an idea that is consonant with our greatest aspirations as American public health workers. It is administered by the Department of State through its Technical Cooperation Administration (TCA). The Institute of Inter-American Affairs has recently become a functional part of the TCA, and its program has been expanded as part of Point IV. The U. S. Public Health Service program in Liberia has been expanded in a similar manner.

The TCA has launched new Point IV programs in Iran and Lebanon. It is now planning health programs in cooperation with 15 of the governments of the Near East and South Asia, from Ethiopia to Nepal. In the field of health, the TCA and ECA meet in the U. S. Public Health Service, which supplies technical support and much of the personnel for both programs.

Today the World Health Organization, and in this hemisphere the Pan American Sanitary Organization, are growing rapidly in strength. As part of the same great international health movement, the United States is working jointly with many nations in the development of effective health services. There is ample evidence that in the field of public health we have a unique meeting ground for the people and nations of the earth, potentially the most fruitful avenue toward the coveted prize of a world of enduring peace. Working thus together toward these great ends, we can see ahead to a world that does not rock with each edition of the day's press, a world in which we, and in which our children also, can live as free citizens at peace, one with the other.

International Health

6. Our Stake in World Health *

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IN an address before the American Public Health Association in 1944, "Public Health as an International Problem," [1] Raymond B. Fosdick noted that the meeting was held "in the midst of a cataclysm more ruthless, barbarous, and destructive than anything the human race has ever experienced."

We meet again in a world shaken by fear and divided by hate, with the shadow of a third world war hanging over us. And since the close of World War II, fantastic advances in science and technology have hurried our world on to its destiny and crowded its peoples ever more closely together into a single community.

Progress in the speed of travel and communication emphasizes the lesson of one world, but two widely contrasting worlds continue to exist side by side: the world of good health, long life, and high standards of living, and the other world of disease, hunger, and premature death. We who live in the relatively healthy and prosperous world are outnumbered about three to one by those who do not happen to be so fortunate, and the disparity is growing.

It would be folly to imagine that two such different worlds can continue to exist side by side in peace, for you cannot expect the peoples of the other world, who have become such close neighbors of ours, to be content to remain forever in the misery to which they have been condemned by the accident of being born in the wrong country.

Two courses are open to us. We may decide to isolate ourselves from the other world and arm to the teeth to defend our homes and our goods. But we know by dearly bought experience that isolation is no longer possible, while history teaches that the armaments race leads inevitably to war, that wars can no longer be confined to small areas, and that world wars reduce victors and vanquished alike to misery and ruin.

Or we can resolve to assist the people of the other world to lift themselves out of their misery by helping them to develop their human and material resources.

Public opinion in our world of plenty is slowly forming in favor of the second course. It is advised by the most advanced economists as well as by the dictates of conscience. I am convinced that mental health authorities would consider it a powerful means of promoting mental health throughout the world.

The speed at which our world is being transformed requires us to act rapidly and with conviction. But our whole inclination is to temporize, to try to gain a little time, to put off the great decision as long as possible. We failed to act in 1920 and the most devastating war in history followed. Now that a third world war threatens, we must act before we become involved in that final catastrophe. Our neighbors in the other world must be given sound reason to believe that help is on the way or they will em-

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brace any doctrine, no matter how destructive to our society, that promises them relief.

If we assume that the underprivileged hordes will overwhelm us unless we offer them help, our action will be grudging, slow, and ineffective. Fear, and the aggressiveness caused by fear, provoke similar reaction in others. Solicitude for our fellows in all countries, sympathy for the less fortunate, the conviction that in world unity lies our only safety and our only chance for real happiness; these must be our motives if we are to succeed in building the foundations of the new world society of which men have always dreamed.

This, then, is the framework in which we view our stake in world health; a world rushing faster and faster to its destiny, its people crowded closer and closer together but torn by hatred and haunted by fear, equipped with the most deadly weapons ever invented, and unable fully to understand or to influence human behavior.

The definition of the word "stake" which I have chosen is that found in Webster's dictionary of synonyms: anything material or nonmaterial which we are in danger of losing. What, then, in this sense is our stake in world health, what, in fact, are we in danger of losing if our support of the World Health Organization continues to be unimaginative and halfhearted?

We may lose the chance to rid the world of those ancient scourges which have afflicted mankind throughout the ages: malaria, plague, cholera, and yellow and typhus fevers. Some, if not all, of these could be wiped out in a few years if we made up our minds to do it. For the present, means and methods of control are far more effective than anyone imagined possible just a few years ago. I need only remind you of the sulfa drugs, the growing list of antibiotics, the new powerful insecticides, and all the synthetics to convince you that we have at our disposal weapons so powerful that their intelligent use will produce miracles of prevention and cure.

We may lose the chance to rid the world of the suffering and death caused by the worst manifestations of the major deficiency diseases: beriberi, scurvy, rickets, pellagra, and others less familiar to us. These diseases still number their victims in millions, yet have been brought under control in the more advanced countries. Governments, working through WHO and the Food and Agriculture Organization of the United Nations, can do for the world as a whole what we have succeeded in doing for our own people. But if we look upon WHO and FAO as nothing more than interesting novelties in international relations, of far less importance than our own Public Health Service or Department of Agriculture, then the deficiency diseases will continue to take their heavy toll of disease and death.

We shall lose our chance to take part in the building up of a great stock pile of knowledge and experience in the maintenance of health and the prevention and treatment of disease. No nation has a monopoly of this knowledge and experience. We owe to German science the idea of synthetic drugs, as well as many effective examples. Penicillin came to us from Britain, insulin from Canada, DDT from Switzerland, the electrocardiograph from The Netherlands. Public health and modern medicine have been built up by the contributions of many workers in many lands. Yet how slow has been the process, how many obstacles have had to be overcome, how many unnecessary delays have occurred. The Health Organization of the League of Nations and WHO, its successor, both inadequately supported, have done notable work in this field. The stock pile is growing. Every day it becomes more valuable as WHO succeeds in promoting the exchange of knowledge

and in developing a universal means of making its treasures available to all countries through standardization of biologicals, already far advanced, through the increasing comparability of vital statistics, by which we measure our progress in health, and through such things as a world pharmacopeia of potent drugs. Every day new useful knowledge is pouring out of research laboratories in many countries. Its wide use is often delayed by the barriers of language and man-made frontiers of prejudice and insularity. Breaking down these barriers, building roads across these frontiers is a task for which WHO is exceptionally qualified.

We may lose the opportunity to build up a world-wide united front in the struggle for good health and disease control. Several armies under separate command are far less effective than the same forces administered as a unit, with common weapons and services. As in warfare, so in disease control: no gaps must be found in the front facing the enemy, every sector must be held by first-class troops armed with the best weapons that science can provide. These armies are the health services and medical and health institutions in the different countries. Some are weak, undermanned, underofficered, and underequipped. In some countries they are virtually nonexistent. To bring them all up to the necessary level of efficiency, much is required in the way of training, experience, and equipment. The advantage of international coöperation is that experience acquired by any country may be used freely by all and that costly equipment need not be duplicated unnecessarily.

You have learned that WHO is engaged in building up this army of health. The least developed countries have the greatest need for more qualified physicians, more trained health officers, more nurses, more sanitary engineers. These countries also stand in greatest need of medical institutions of all kinds: hospitals, medical and public health and nursing schools, research institutes, health centers, and many others. It will take time and money to provide them, but in a coöperative world, existing medical institutions may be used to capacity, ignoring political frontiers, so that a start may be made at once. Existing schools may join in organizing international courses, as they have done in the past, and the fellowship program may be greatly expanded, so that hundreds of suitable candidates from countries lacking the necessary institutions may be qualified in other countries. Every increase in the number of trained health workers will bring added efficiency in the fight against disease; every moment that we hesitate to throw our wholehearted support to world health means unnecessary suffering and death to men, women, and children in many countries.

We may lose the chance to build peace into the minds of men. Our present age is characterized by aggressiveness and competition. These qualities may have been necessary for survival when food production could not keep pace with population growth, but they are anomalies in the industrial and scientific world of today. Coöperation is the key to our survival, but aggressiveness and competition persist. Our problem is to make the challenge of peace appeal to men more strongly than the excitement of war. Progress in the development of new lethal weapons of war far exceeds the rate of advance in our understanding and control of human behavior. We do not allow a child of five to take the throttle of a great locomotive pulling thousands of passengers at high speed through the night, but minds just as immature are likely to be found in control of far more lethal forces.

The challenge of the times is to sublimate man's aggressiveness into vigor-

ous coöperative action toward building a world society in which opportunities for health, long life, rising standards of living, and freedom will be open to men, women, and children of every race, creed, or country. Our present aggressiveness and competitive spirit must give way to compassion, sympathy, and cooperation. Advances in our knowledge of human psychology, sociology, and psychiatry, built into programs of mental health, give the most promise of success. WHO's present limited programs for mental health need to be developed and expanded until they cover the earth. Combined with education and other social measures, they may turn out to be keys to the solution of our most pressing problem—how to build peace into the minds and hearts of men, how to adapt man's behavior to the conditions and complications of the new world in which he lives.

We may lose the chance to gain experience in working together for purposes in which all men believe and in which there is no need for competition. The supply of health is unlimited. If your neighbor gains in health, you lose nothing. If epidemic diseases are wiped out in India or China, the whole world profits. "By pooling its brains and resources the human race can add to its own well-being."[2] Better health throughout the world is well worth working for, but the experience gained by working together may prove in the long run to be of far greater value. For world society in this industrial and scientific age cannot exist without some form of world government to facilitate the coöperation of peoples and to restrain the violence of unruly nations. There are those who would do away with the United Nations and all the specialized agencies, substituting therefor a world constitution, a world parliament, and a complete apparatus of world government on the model of federal governments in Switzerland or in this country. Unfortunately, mankind learns by slow experience, often by trial and error. The pages of history are full of noble experiments which failed: the Kellogg Pact, the Locarno agreements, the treaties of peace, and the Charter of the League of Nations. World government must be built brick by brick, beginning in areas of common interest where coöperation is possible and the results are of benefit to all.

The World Health Organization is peculiarly fitted to become the spearhead of a world revolution which will have as its aim not the destruction of present civilization, but the organization of a peaceful world, not the leveling down of all countries to lower standards of living, but the raising up of the poorer countries to the standards of the most healthy and prosperous. This is within our grasp; we have the ability and the means to do it; only the will falters, only the imagination fails.

Just a few years ago the Charter of the United Nations was signed in San Francisco by the delegates of many nations. This act of faith has given birth to magnificent buildings in New York City, where men and women of many countries strive by day and by night to solve the problems which trouble the peace of the world. Since its establishment the United Nations has been ceaselessly engaged in a desperate struggle to prevent the spread of war. Its attention has of necessity been concentrated on the prevention of aggression, the policing of the world. I realize that police forces are essential even in our most advanced cities. But peace is never a product of police forces alone. It is the fruit of mature minds in a healthy social and economic environment. I do not mean to decry the activities of the Security Council and the Assembly when I say that the real work of the United Nations is the organization of peace. Peace might be built, little by little, if men could be persuaded

that the building of peace is just as important as the prevention of aggression. For police action may detect and punish the criminal, but rooting out the causes of crime is a task for other forces.

Economic and social development is needed to heal a sick world and set it on its feet. We have in the United Nations and the specialized agencies all the machinery needed for this purpose, but the machinery is idling for lack of fuel. Two-thirds of the world's population is crying for relief from disease, hunger, premature death, and poverty but does not know where to turn for relief. WHO, above all other international agencies, is fitted to show the way, for its jurisdiction is in one of the few areas where men of all races and creeds can work easily together.

This being the case, how adequately are we supporting WHO? Far less adequately than our own national health services. WHO and all its branches could be swallowed up without trace by the U. S. Public Health Service or the Ministries of Health of Britain or the U.S.S.R. It is surpassed in size, staff, and budget by some of our state departments of health. We might logically conclude that WHO is regarded as something less important than the health department of a large city.

Other UN specialized agencies concerned with health fare no better. FAO is exceeded in all respects by one bureau of our Department of Agriculture; it is regarded, financially speaking, as somewhat less significant than a state bureau of food and drugs. UNESCO, with its potentially wide coverage of subject matter and territory, is surpassed in all material respects by the New York State Department of Education. Is it not ironic that so many should cry for the moon in the form of a complete system of world government while the governments of the advanced countries seek to reduce their puny contributions in support of the only instruments of world government that now exist or are likely to exist in the near future?

This situation places a very heavy responsibility upon professional health workers, who should understand better than any other group the potentialities of WHO and the leading part it is capable of playing in organizing the peace of the world and in building up, little by little, the constructive aspects of world government. Joining hands with our colleagues in other countries, we must take our people up to the mountaintop where they can see the promised land of good health, peace, and freedom stretching before them. When their eyes have been lifted to these wider horizons, there will be no further question of reducing WHO's budget to a few millions.

I cannot imagine anything more inspiring than the opportunity which is open to us to lead the way in this pioneering adventure. It therefore gives me the very greatest satisfaction to be able to announce to you that the National Health Council has decided to organize a Citizen's Committee for the World Health Organization. It will be the task of this committee to make known to all our people the work and potentialities of world health. It will educate and organize public opinion, so that our political leaders need never be in doubt about the peoples' support of WHO and all other UN agencies concerned with physical and mental health. We who pride ourselves on our skill in using the tool of health education will find this task worthy of our best efforts. It will give new zest to our work, new interest to our lives. It will fit us better to become useful members of a united world society.

The preamble to the Charter of the United Nations begins with the words, "We, the peoples of the United Nations. . . ." These words were used to emphasize that the new world must be built by peoples as well as by govern-

ments. The initiative of the National Health Council in setting up a United States Citizens' Committee will give the people of our country an opportunity to work for world health as the spearhead of a movement for the organization of world peace. It will give professional health workers the privilege of taking the lead in meeting the most exciting and momentous challenge mankind has ever faced.

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Watching for Epidemic Outbreaks

An Epidemic Intelligence Service has been established by the U. S. Public Health Service. In 16 centers in 12 states, 21 medical officers of the Service have taken up their posts with the primary job of rendering "assistance in investigating disease outbreaks beyond the resources of state and local health departments to control. They will also be on call for epidemic aid anywhere in the nation at the request of state health officers."

The 21 have recently completed an intensive eight week training course in the Communicable Disease Center at Atlanta.

The center's chief of epidemiological services, Alexander D. Langmuir, M.D., is in charge of the Epidemic Intelligence Service.

Recent Developments in the Prophylaxis of Rabies*

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A PRACTITIONER or a public health officer facing either a worried individual exposed to the bite of an animal or, what is worse, a deeply perturbed parent of a child injured by a possibly rabid animal is confronted nowadays by a distressing dilemma in advising proper protective treatment.

If he was graduated from medical school prior to 1935 he was most certainly instructed in the course of his studies to follow the time-honored, almost routine, practice of giving the Pasteur treatment to every person who came in contact with an animal which behaved abnormally. This Pasteurian attitude toward antirabies treatment may perhaps be best expressed by quoting from a letter written by Professor Claudio Fermi on June 18, 1951, to the members of the WHO Expert Committee on Rabies. Professor Fermi, whose past contributions in the field of rabies are of unquestionable merit, expressed in his letter the following opinions:

> 1. Begin the course of vaccination immediately if there is the least suspicion of rabies in the biting animal, and not wait until the animal shows signs of rabies. 2. Start treatment even in case of light wounds made by suspected animals (scratching and licking), which can also be fatal.

Although it is possible that adherence to such advice as Professor Fermi's may have saved many lives, it took half a century before it was realized that the Pasteur treatment carried with it two major prejudicial conditions: First, the questionable value of the treatment in cases where severe wounds have been inflicted by frankly rabid animals, and, second, the occurrence of neuroparalytic accidents following such treatment.

These disadvantages of the Pasteur treatment, though still denied by certain workers in the field of rabies [1] are supported by concrete evidence. Otten,[2] in a careful analysis of many cases of failure reported for the Pasteur method, came to the conclusion that there was little advantage in treating cases when exposure to rabies was so severe that the incubation period was less than 30 days. These findings seemed to receive ample confirmation by observations on cases of wolf bites in Iran made by Ghodssi [3] and by Baltazard,[4] Director of the Pasteur Institute in Teheran. These workers reported 30 per cent mortality in exposed individuals, despite the fact that an intensive course of antirabies vaccination employing the Fermi vaccine was instituted in every single case.[4]

References to the occurrence of neuroparalytic accidents following the Pasteur treatment are too numerous to be discussed in the present paper. Again, it is possible to challenge the recommendation of Fermi, in the letter referred to,

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that treatment of suspicious cases not be stopped just to avoid paralysis because, according to Fermi, "the percentage of post-paralysis death is 50 times smaller than the percentage of cases of rabies." The data of Pait and Pearson,[5] collected in the County of Los Angeles for the years 1940–1946, indicate just the opposite. The incidence of neuroparalytic accidents was 1 in 600 (a total of 9 cases) of the vaccinated individuals, whereas the chance of acquiring rabies from dogbite varied from 1:1,400 to 1:2,100. During the period 1946–1949, 3,000 patients received Pasteur treatment in Manhattan and 5 of these developed postvaccinal paralysis, or, again, an incidence of 1 in 600.[6] It is recognized that a postvaccinal paralysis incidence rate is being compared with a mortality rate, and yet some comparison can be made.

It can thus be seen that the first problem facing a physician considering protective treatment of a supposedly exposed individual is to balance the risk of the vaccination procedure with the possibility that the patient may contract rabies. Perhaps this problem has never been better stated than by the most lucid mind of modern times, George Bernard Shaw, in the Preface to the play, "The Doctor's Dilemma": [7]

> The vogue of the Pasteur treatment of hydrophobia, for instance, was due to the assumption by the public that every person bitten by a rabid dog necessarily got hydrophobia. I myself heard hydrophobia discussed in my youth by doctors in Dublin before a Pasteur Institute existed, the subject having been brought forward there by the scepticism of an eminent surgeon as to whether hydrophobia is really a specific disease or only ordinary Tetanus induced (as tetanus was then supposed to be induced) by a lacerated wound. There were no statistics available as to the proportion of dogbites that ended in hydrophobia; but nobody ever guessed that the cases could be more than two or three per cent of the bites. On me, therefore, the results published by the Pasteur Institute produced no such effect as they did on the ordinary man who thinks that the bite of a mad dog means certain hydrophobia. It seemed to me that the proportion of deaths among the cases treated at the Institute was rather higher, if anything, than might have been expected had there been no Institute in existence. But to the public every Pasteur patient who did not die was miraculously saved from an agonizing death by the beneficent white magic of that most trusty of all wizards, the man of science.

And then in another place:

> The results of ordinary private-practice-inoculation at their worst are bad enough to be indistinguishable from those of the most discreditable and dreaded disease known.

Little he knew, the late wizard from Ayot-St. Lawrence, that his words written in the year 1906 can be applied, and only too pointedly, to the issue of vaccination against rabies in the present year 1951.

To compose a guide for rabies prophylaxis is a difficult and unsatisfying task because inevitably the result will not be universally acceptable. The Report of the First Session of the WHO Expert Committee on Rabies includes the opinion of the members on indications for vaccine treatment. These recommendations are reproduced in Table 1. This is intended solely as a guide for public health authorities and should not be treated as a Delphian revelation, to be followed blindly in every single instance.

It may be observed that the members of the Committee tried as much as possible to avoid indiscriminate use of the Pasteur treatment and favored its application only in cases of bites and licks by uncaptured and rabid or wild animals. Multiple bites of the head, neck, and shoulder were also considered as an indication for treatment, although it remained obvious that if the animal inflicting these wounds were rabid, the bitten individual had little chance of escaping rabies in spite of treatment.

Similar opinions regarding the advisability of Pasteur treatment were

TABLE 1

Indications for Vaccine Treatment

Nature of Exposure	*Condition of Biting Animal*		*Decision as to Vaccine Treatment at Time of Possible Exposure*
	At Time of Exposure	*During Observation Period of 10 Days*	
I. No lesions; indirect contact only	Healthy or rabid	Healthy or rabid	None
II. Licks:			
(1) unabraded skin	Healthy or rabid	Healthy or rabid	None
(2) abraded skin or mucosa	(a) Healthy	Healthy	None
	(b) Healthy	Clinically suspicious or proven rabid	Start treatment at appearance of first suspicious signs
	(c) Suspicious	Healthy	Start treatment immediately; stop treatment if animal remains normal for 3 days
	(d) Animal rabid, escaped, killed, or unknown		Start treatment immediately
III. Bites	(a) Healthy	Healthy	No treatment, except if bites are multiple, or face, head or neck bites; then treat as in III(c)
	(b) Healthy	Clinically suspicious or proven rabid	Start treatment at appearance of first suspicious signs
	(c) Suspicious	Healthy	Start treatment immediately; stop treatment if animal remains normal for 3 days
	(d) Animal rabid, escaped, killed, or unknown; or any bites by jackal, wolf, fox, or other wild animal		Start treatment immediately

NOTE: Bites on the head, neck, and shoulders, deep multiple wounds, and those inflicted by wild animals involve a greater degree of risk, and patients should be treated accordingly.
SOURCE: WHO Expert Committee on Rabies. WHO Technical Report Series No. 28, 1950.

recently expressed by Sellers,[8] who considers antirabic treatment as contraindicated in the following instances:

1. When there is no broken skin anywhere on the body, including face or mouth
2. If previous wounds are known to be over 24 hours old or are covered with an unbroken scab
3. If the tooth wounds were made through untorn clothing—such wounds are usually bruises
4. If exposure is limited to handling only the dog or objects contaminated with the saliva, or to drinking the milk of rabid cows or goats
5. If the wounds were inflicted not less than 7 days prior to the detection of visible signs of the disease
6. If the animal remains normal for as long as 7 days after inflicting the wounds

Some workers in the field of rabies have already challenged and opposed the WHO outline for antirabic treatment,[9] and others will probably do so in the future. However, regardless of how vociferous this opposition is and will be, one thing has to be made clear: With the exception of Sellers, no one has as yet presented even a remotely similar, constructive scheme of action for public health officers in cases of emergency. There is a great likelihood that if this outline is followed, the incidence of neuroparalytic accidents will decrease without a consequent rise in the incidence of human rabies.

As we have mentioned above, there is great dubiety, to say the least, as to the efficacy of the Pasteur treatment in cases of severe exposure to rabid animals, regardless of whether the original Pasteur vaccine, or the Semple, or numerous modifications of either are used. Frequently, letters are received by our laboratory from health officers throughout the country, who complain about the unsatisfactory outcome of the so-called "classical techniques" of antirabic treatment and ask advice about

TABLE 2

Summary of Data on Use of Rabies Antiserum in Man

Total Number of Persons Treated with Antiserum	Condition of Biting Animal and Number of Persons Exposed			Location of Bite			Severity of Bite		
	Nonrabid	Unknown (Not Captured)	Rabid	Head and Neck	Arms and Hands	Legs and Feet	Severe	Moderate	Mild
48	11	8		4	3	1	4	1	3
			29	8	19	2	9	12	8

procedures which may improve the patient's chances to survive exposure.

It is strange that although there has existed since 1889 a prophylactic measure which might logically have been used in attempting to improve the efficacy of antirabic treatment, except for several courageous individuals, workers in the field of rabies have condemned the use of antirabies serum as an adjunct of the Pasteur treatment. Consequently, this classic approach almost sank into oblivion in so far as rabies prophylaxis is concerned. Of the few scattered workers who attempted to continue the work pioneered by Babes and Lepp,[10] one should mention Fermi in Italy,[11, 12] who has employed serum in the treatment of exposed individuals since 1911; Shortt, *et al.*,[13] who used serum in India; and Proca and Bobes,[14] who employed antiserum in their treatments in Rumania.

It is true that until the year 1936, when Hoyt, *et al.*,[15] published their studies on the passive immunization of mice against rabies, experimental tools and techniques employed in the evaluation of antiserum were crude and not too reliable. However, the work of Hoyt[16] and Habel,[17] as well as studies conducted in our laboratory,[18, 19] have proved beyond doubt that antirabies serum has definite protective power in the treatment of exposed laboratory animals. Moreover, results of experiments conducted in hamsters indicated that antiserum given within 24–72 hours after inoculation with street virus will protect the majority of exposed animals. In contrast, we were unable in any experiments to save the life of a single animal exposed to street virus and then treated *only* with serial injections of phenolized vaccine. The results of these experiments, which simulated natural conditions as much as possible, seemed to warrant extensive clinical trials in man. This attitude was adopted by the members of the WHO Expert Committee on Rabies, and yet it met with the opposition of such workers as Remlinger[1] and Nikolic.[9] The latter condemned the use of antirabies serum, not on the basis of experimental work which he passed over hurriedly, but on the grounds of the personal opinion of Bobes and the scant evidence obtained in the serum treatment of exposed individuals in Turkey. More will be said about the evaluation of antirabies treatment in human beings later.

In this country concentrates of antirabies serum prepared either in rabbits or in sheep were made available for clinical trials in 1948. Each vial of antiserum was accompanied by a questionnaire, and the physician responsible for the case was asked to fill it out and return it to our laboratory. Approximately 75 per cent of the distributed questionnaires have now been returned and Table 2 is a composite of the responses.

You may observe that of a total of 48 cases which received antiserum, 11 were exposed to bites of nonrabid animals, and this group will not be dis-

cussed further. Eight persons were bitten by animals not captured: 4 were bitten on the head or neck, 3 on the arms, and 1 on the leg. The severity of bite was judged by the attending physician and in 4 cases was considered to be mild or moderate, but severe in 4 other cases.

The largest group in the series is comprised of 29 persons who were treated with antiserum after having been bitten by animals which were shown to be rabid either by the presence of Negri bodies in the brain tissue or by virus isolation in mice. Of these 29 cases, 8 were bitten on the head or neck, 19 on the arms or hands, and 2 on the legs or feet. Nine were classified as severe exposures, 12 as moderate, and 8 as mild.

In most but not all cases, administration of serum was followed by phenolized vaccine treatment of varying duration and intensity. Not a single fatality was observed in this series, but we cannot state that this fact indicates significant efficacy of the antiserum, because the presence of Negri bodies and demonstrable virus in the central nervous system is not always correlated with the presence of virus in the saliva. In other words, animals do not bite with their brains. Thus, we do not know in how many instances the patients were actually exposed to contact with the virus.

One of the cases may be worth mentioning as a probable exception. This was an animal attendant who, while cleaning a cage housing guinea pigs inoculated with street virus, was bitten by an animal which inflicted a deep penetrating wound on the wrist. The culprit was sacrificed immediately, its salivary glands removed, made into a suspension, and titrated in mice. The LD_{50} titer was $10^{-4.50}$ and this case can thus be considered, with only slight reservation, as one of definite exposure.

The principal difficulty, therefore, in a statistical evaluation of the effect of antiserum lies in the impossibility of defining an actual exposure. Yet this fact alone should not discourage the use of antiserum. Experimental evidence is strong in its favor and a certain amount of comfort should be drawn from the fact that no person who has received antiserum has yet died of rabies.

INDICATIONS FOR ANTISERUM TREATMENT

In every case of severe exposure the use of antiserum should be considered. It should be administered within the shortest possible time following exposure, preferably within 24 hours, and certainly not later than 72 hours after exposure. Experimental evidence obtained in hamsters indicates that antiserum has no protective power if administered 96 hours after inoculation with virus. At the present time it may be advisable to employ antiserum treatment in conjunction with vaccine. We feel certain that the course of vaccine may then be shortened considerably, thus decreasing the risk of neuroparalytic accidents.

Treatment with vaccine could be initiated 24 hours after administration of antiserum, but, since the presence of rabies antibodies lasts 7 to 10 days after passive immunization, there is reason to believe that the first injection of vaccine can be given at any time within this period.

Antiserum should be quite valuable in those cases of human exposure in which the fear of rabies is greater than the danger of rabies itself. For instance, in cases of bites by known, usually friendly, animals, the administration of antiserum may temporarily alleviate the anxiety of the patient until normal behavior of the suspected animal during the observation period completely dispels his fear. Conversely, were the animal found to be rabid, adjunct treatment with vaccine may still be started before passive immunity fades away. This "psychological" effect of antiserum

may be also considered in those who might be exposed again within one year after receiving a course of Pasteur treatment, and who feel uncomfortable if no form of protective treatment is applied. In such instances, antiserum alone, of course, could and probably should be administered. The dose presently recommended is 0.50 ml. per kg. of body weight. Each case should always be considered individually and, if a very heavy exposure is observed, the amount of antiserum may be proportionately increased.

Serum sickness was noted in about 20 per cent of those who were treated with rabbit serum concentrates, but a much greater proportion was observed in those who received sheep serum concentrates. The production of serum in sheep has therefore been discontinued in favor of either horse or rabbit serum concentrates. Of course, the physician in charge of the case, faced with a choice of three evils, should decide to use antiserum, since serum sickness would be preferred to rabies or a neuroparalytic accident should it turn out that the animal is rabid.

It is needless to add that careful analysis of every case which receives serum will help in the ultimate evaluation of serum treatment. The biting animals should be examined with particular care, and, if rabid, not only brain but also salivary gland tissue should be checked for the presence of virus. This may appear to be an extravagant demand; however, it is only by means of such procedure that we may select those individuals whose risk has been maximal for the final determination of the efficacy of rabies antiserum treatment.

FUTURE DEVELOPMENTS

If the experience gained through the use of antiserum in treating exposed persons confirms the data obtained in experimental work, it may be feasible to consider further reduction of the number of injections of phenolized vaccine following antiserum treatment. Experimental work has been initiated on the immune response of monkeys receiving one injection of antiserum followed 6 days later by one injection of phenolized vaccine. The results are still incomplete and are based solely on serological evidence of immunity; the actual proof of the efficacy of such a procedure can only be established after challenge with street virus.

Finally, a word should be said about the chick-embryo-adapted Flury strain of rabies virus. Its use in the avianized rabies vaccine for the immunization of dogs has indicated its broad antigenic value; this strain may be considered for human use when clinical trials have confirmed the safety and effectiveness of the procedure. If antiserum becomes a standard item in the armamentarium of antirabies treatment, then, of course, the use of live virus vaccine will be conditioned by the demonstration of its ability to immunize in spite of antiserum treatment.

While the laboratory has contributed a great deal to the control of rabies and will continue to do so through diagnostic services and the development and testing of new and better methods of preventing the disease, rabies is not just a laboratory problem, nor can it be shrugged off and tossed into the laps of the public health authorities. In spite of its relative infrequency, it stands out from all other infectious diseases because the illness, once symptoms and signs are present, always ends in death. Rabies is a preventable disease and its prevention is primarily a community-wide responsibility.

Remlinger's often quoted article [1] takes the American program of work on rabies vigorously to task. In the last paragraph of his paper he indicates that despite the formation of various committees for the organization of the fight against rabies, statistics in the United

States, particularly in the states of Illinois and Alabama, do not show that the number of cases has decreased. Commenting upon the plans of the WHO Expert Committee on Rabies to organize clinical trials in Palestine and Egypt for the eradication of rabies, he pointedly asks:

"Why not choose the two states (Illinois and Alabama) for such a program, rather than Palestine and Egypt. Charity begins at home."

All we can say is "Amen!"

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Study on Etiology, Epidemiology, and Antibiotic Therapy of Infantile Diarrhea, with Particular Reference to Certain Serotypes of *Escherichia coli* *†

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EPIDEMIC diarrhea of the newly born is a particularly formidable disease, since it frequently carries a high mortality rate. Although a considerable amount of research has been carried out regarding the etiology of this malady and diarrheal disease of older infants, much remains to be learned.

It has been established that infantile diarrhea is not due to a single causative agent. Outbreaks of this disease may be caused by recognized pathogenic enteric bacilli, such as Salmonellas, as well as by potentially pathogenic species, such as *Pseudomonas aeruginosa* (*B. pyocyaneus*). Furthermore, *Streptococcus fecalis* has been incriminated by Gale [1] and a virus by Light and Hodes.[2] In certain outbreaks none of these microörganisms can be found, so that it appears likely other etiological agents may be involved.

In 1927, Adam [3] described coliform bacilli which he considered to be related to diarrheal disease and which he referred to as "Dyspepsie-koli." His observations were extended by Goldschmidt.[4] The problem as to whether or not *Escherichia coli,* which is normally present in the intestinal tract of all mammals, may be responsible for diarrheal disease of infants has been intensively investigated recently by Bray,[5] Bray and Beavan,[6] Giles and Sangster,[7] Giles, Sangster, and Smith,[8] Smith,[9] Taylor, Powell, and Wright,[10] Beeuwkes, Hodenpijl, and ten Seldam,[11] Kauffmann and Dupont,[12] Braun, [13] as well as by Neter and Shumway.[14] Of the more than 100 different serological types of *E. coli,* two have been found associated with infantile diarrhea: one of these has been referred to as *Bacterium neapolitanum,* alpha type, D433, and as type 0111; the other has been described as beta type and type 055. The fact that either of these microörganisms was recovered in certain outbreaks from a large number of infants suffering from infective gastroenteritis but only rarely from other infants, children, and adults, suggests the possibility of their etiological significance. Proof to this effect, however, awaits the fulfillment of the fourth postulate of Koch that the isolated microörganism should reproduce the same disease in a suitable host.

This report summarizes our observa-

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tions on the etiology, epidemiology, and antibiotic treatment of infantile diarrhea associated with the presence of certain serotypes of *E. coli*. Such a presentation seems to be timely, since, as late as 1950, in an excellent review on epidemic diarrhea of the new-born by Gordon and Rubenstein [15] the possible relationship of these types of *E. coli* to this malady is not even mentioned.

E. coli (0111 and 055) as Etiological Agents of Infantile Diarrhea: The question as to whether these epidemiologically suspected types of *E. coli* are indeed the cause of diarrheal disease could be answered readily if it were possible to reproduce the malady in experimental animals. This, however, has not yet been accomplished. Giles and Sangster [7] have administered *E. coli* 0111 by mouth and per rectum to newborn mice and kittens without producing any effects. It is therefore necessary to elucidate this problem on the basis of clinical-bacteriological observations. Recently, two of us (Neter and Shumway [14]) reported that the ingestion with the formula of approximately 100 million viable organisms of *E. coli* serotype 0111 (D433) by a two month old infant with multiple congenital defects, including the brain, who did not previously harbor this microörganism in the feces or respiratory tract, resulted within 24 hours in diarrhea and weight loss of 7 ounces. On the following day, serotype D433 was demonstrated in small numbers in the throat and in large numbers in the feces, but not in the nasopharynx. Two days later this organism was present in very large numbers in the nasopharynx, throat, and feces. Ingestion of a different type of *E. coli* recovered from the feces of this infant prior to its contact with serotype D433 did not cause diarrhea or weight loss.

We had the unusual opportunity to be able to follow bacteriologically and clinically three infants with diarrheal disease and vomiting who did not harbor either of these serotypes of *E. coli* (0111 and 055) preceding their illness. The first of these infants was a three week old baby. No coliform bacilli were present in the nasopharynx or throat prior to the diarrheal attack; *E. coli* present in the feces at that time was of serological type or of types other than 0111 or 055. During the diarrheal episode, which was associated with weight loss, *E. coli* 0111 was present in large numbers in the nasopharynx, throat, and feces. No other enteric pathogens were present and there was no evidence of exposure to any other intestinal incitant. The second infant, suffering from diarrheal disease and vomiting associated with weight loss, harbored *E. coli* 055 in the throat and feces at the time of this illness. Prior to this episode, however, this microorganism was not present in the throat, nasopharynx, or feces. Again, there was no exposure to other enteric pathogens. The third infant developed diarrhea associated with the presence of *E. coli* 055 in the throat and feces. For two days prior to this episode of diarrheal disease, coliform bacilli were absent from the throat, and *E. coli* present in the feces was of serological types other than 055 and 0111.

These observations give further evidence of the potential pathogenicity of these serotypes of *E. coli* for infants as cause of diarrheal disease with or without vomiting. Whether the diarrheal disease is the result of actual infection (invasion of the tissues) or is due to toxins released by these microörganisms remains to be elucidated. It must be emphasized, too, that the presence of these serotypes of *E. coli* in the alimentary tract of infants need not be associated with clinical manifestations. This is evident from the following observation. A one week old infant harbored *E. coli* 0111 in large numbers in nasopharynx, throat, and feces. There was no diarrhea or vomiting. Subse-

quently, the child harbored *E. coli* 055 in the upper respiratory and intestinal tracts without clinical evidence of diarrheal disease or vomiting. Payne and Cook [16] isolated *E. coli* 0111 from 10 out of 15 infants in a home in the absence of infantile diarrhea and vomiting. Whether some infants are resistant to these serotypes of *E. coli* due to passive immunity or other mechanisms is unknown; this problem is being investigated by the authors.

The evidence on hand at the present time indicates that these serotypes of *E. coli* are associated with epidemic and sporadic diarrheal disease of infants and are encountered far less commonly in gastroenteritis of older children and adults. Such a relationship between degree of pathogenicity and age of the host is not without parallel. For example, the Coxsackie virus can be readily propagated in the suckling mouse and is not pathogenic for the older animal. Mention should be made of the facts that Stevenson [17] isolated *E. coli* 0111 from adults suffering from diarrhea and that feeding of this serotype to adult volunteers resulted in diarrhea, as reported by Kirby and associates.[18]

The question naturally arises, whether these two serotypes of *E. coli* are responsible for infections in other parts of the body, such as peritonitis, meningitis, pyelitis, and others. Giles, Sangster, and Smith,[8] isolated *E. coli* 0111 from the liver and spleen of 10 fatal cases of infectious gastroenteritis; in two, the organism was recovered from the middle ear and in one case from the meninges at the post-mortem examination. It is clear, then, that this type of *E. coli* may invade, although it does so only rarely, organs other than the gastrointestinal tract. In this connection it is interesting to note that one of our patients, harboring *E. coli* 0111 in large numbers in the intestinal tract, developed fatal *E. coli* meningitis; the strain of *E. coli* present in the meninges was not of the 0111 type. Obviously, the patient's own *E. coli* must have been the infecting organism, and not the strain 0111, which was superimposed on his gastrointestinal flora and was responsible for the diarrheal disease.

The serological types 0111 and 055 usually are not involved in *E. coli* infections other than gastroenteritis and do not make up the normal *E. coli* flora. Among 721 cases (infants, children, and adults) Giles, Sangster, and Smith [8] isolated *E. coli* 0111 in only 1.8 per cent of the cases; *E. coli* 055 was found in only 3 out of 53 healthy infants and 1 out of 74 adults. Likewise, *E. coli* 0111 was isolated in only 4.2 per cent of 169 children up to the age of 18 months and in 1.8 per cent of 266 individuals older than 18 months. To date we have examined 608 consecutive strains of *E. coli* isolated from a variety of sources, with the exception of patients having infantile diarrhea. All proved to be of types other than 055 and 0111. The source of these strains is given in Table 1 as follows:

TABLE 1

E. coli Serotypes Other Than 055 and 0111

Source	*No. of Strains*
Feces	316
Throat	138
Urine	62
Nose	37
Peritoneal	17
Vaginal	12
Middle ear	8
Abscess	5
Umbilical	3
Skin	3
Spinal fluid	3
Blood	3
Sputum	1
Total	608

Epidemiological Aspects: The reason why certain microörganisms produce infection in epidemic form and other organisms do not do so is largely unknown. It is clear, however, that the same etiological agent can be responsible for larger outbreaks only if it is intro-

duced into a group of susceptible hosts, often referred to as a herd. It is important to realize that any sporadic case may become the nucleus for an epidemic under suitable circumstances. On the basis of the data available, including hospital cross-infections, it is evident that infants suffering from diarrheal disease associated with the presence of *E. coli* serotypes 0111 or 055 should be isolated. The scope of the problem of cross-infection in hospitals is tragically illustrated by the fact that in the series of infants observed by Giles, Sangster, and Smith,[8] 122 out of 207 cases (58.9 per cent) acquired the infection at the hospital and that in one ward 66 per cent of cases became infected clinically. It is also clear that since infectious gastroenteritis of the newly born and small infant is not a mono-etiological disease, the concept of a "diarrhea ward" is not sound, unless cross-infections can be prevented or only patients harboring a single and identical causative agent are admitted. An infant harboring Salmonellas may become the source of infection of another patient infected with *E. coli*, and even a child harboring *E. coli* 0111 may infect another one suffering from gastroenteritis associated with the presence of *E. coli* 055. Careful bacteriological examinations are indicated, not only during epidemic outbreaks but also in sporadic cases.

Until recently the transmission of diarrheal disease was considered as largely associated with direct or indirect contact with feces. Recent studies from this laboratory, however, indicate that in infants and children certain enteric pathogens (Salmonelleae, Shigellae) are present in the upper respiratory tract and may conceivably be spread by these patients like an air-borne infection (Neter [19]). *E. coli* 0111 and 055 have been demonstrated in the nasopharynx by Taylor, Powell, and Wright [10] and others. To date we have found the two serotypes of *E. coli* under consideration in the upper respiratory tract in 11 out of 14 cases. It has been shown conclusively that these organisms increase in number in the throat and nasopharynx or both following their first appearance. In the absence of vomiting in some of these infants, this represents actual multiplication of *E. coli* on the mucous membrane of the upper respiratory tract. Studies are in progress to determine whether, and to what extent, these organisms can be demonstrated to be in the air, and thus capable of being spread like an air-borne disease.

Antibiotic Therapy: In view of the fact that as recently as 1947 Giles, Sangster, and Smith [8] have encountered a mortality rate of 50.6 per cent in 207 infants suffering from epidemic gastroenteritis associated with the presence of *E. coli* serotype 0111, it is important to evaluate the broad spectrum antibiotics in this condition. Neter and Shumway [14] have reported that their strains of *E. coli* 0111 and 055, including several strains isolated in England, were highly susceptible *in vitro* to 10 μg. per ml. of aureomycin, chloromycetin, terramycin, and polymyxin B. Only one strain was inhibited by streptomycin in like concentration. Penicillin (500 u.) and bacitracin (100 u.) were ineffective. Sulfadiazine in concentration of 12.5 mg. per ml. prevented the growth of only two out of nine strains. These investigations have since been extended, and the results on the *in vitro* susceptibility of *E. coli* types 0111 and 055 to various antibiotics are summarized in Table 2.

These data clearly indicate the potential usefulness of the broad spectrum antibiotics and polymyxin B. Thus far we have treated 9 patients suffering from diarrheal disease associated with the presence of either *E. coli* 055 or 0111 with aureomycin, terramycin, or chloromycetin. Five patients received aureomycin by mouth in amounts of 50 to 70 mg. per kg. per 24 hr. This treatment

TABLE 2

In vitro Sensitivity of E. coli (0111 and 055) to Various Antibiotics

E. coli	*Penicillin*		*Streptomycin*		*Aureomycin*	*Chloromycetin*		*Terramycin*		*Bacitracin*
	1 u.	*10 u.*	*1 μg.*	*10 μg.*	*60 μg.*	*10 μg.*	*60 μg.*	*10 μg.*	*60 μg.*	*10 u.*
Type 0111:										
1	0	0	0	0	2	3	4	3	3	0
2	0	1	0	2	1	2	3	1	2	0
3	0	0	0	3	2	3	4	2	3	0
4	0	0	0	0	1	3	4	2	3	0
5	0	0	0	0	2	3	4	1	3	0
6	0	0	0	0	1	3	4	1	3	0
7	0	0	0	0	2	3	4	1	3	0
8	0	0	0	0	2	3	4	2	3	0
9	0	0	0	0	2	3	4	2	3	0
10	0	1	1	3	2	3	4	2	3	0
11	0	1	1	3	2	3	4	2	3	0
12	0	0	0	3	2	2	4	3	3	0
Type 055:										
1		0	1	3	2	3	4	2	3	0
2		0	0	2	2	2	4	2	3	0

0 = Not sensitive
1 = Slightly sensitive (zone up to 12 mm.)
2 = Moderately sensitive (zone from 13 to 16 mm.)
3 = Sensitive (zone from 17 to 25 mm.)
4 = Highly sensitive (zone greater than 26 mm.)

resulted in the eradication of the organism within 4 days. Two patients received terramycin in amounts of 65 to 70 mg. per kg. per 24 hr. with identical results. Two patients were treated with chloromycetin intramuscularly; one patient received 35 mg. per kg. per 24 hr. and the organism, which was present in large numbers in the throat and feces, disappeared within 3 days. The other patient was treated with the injectable chloromycetin in amounts of 150 mg. per kg. per 24 hr. for 7 days. *E. coli* present in throat, nasopharynx, and feces was suppressed but not eradicated.

In all cases the diarrheal disease prior to treatment was not severe. Clinical improvement followed treatment with these antibiotics within 24 to 72 hours. Favorable results have been reported also by Rogers, Koegler, and Gerrard[20] with chloromycetin, and by Magnusson, Laurell, *et al.*,[21] with aureomycin. In this connection, reference may be made to the observation of Smellie,[22] who found chloromycetin strikingly effective in infantile gastroenteritis. It must be stressed, however, that the etiologic agent in this series was not identified.

Further studies on the efficacy of these antibiotics are definitely needed. The optimal dosage schedule of these antibiotics in this condition remains to be established. It is still a moot question whether the eradication of the organism following the use of such antibiotics is a permanent one. It also remains to be investigated whether parenteral is as effective as oral administration. Aureomycin and terramycin can be injected intravenously. A preparation of chloromycetin * is being investigated at the present time which may be given either intravenously or intramuscularly. At Children's Hospital, together with Dr. Robert S. McCurdy, we have thus far treated 40 patients, with a variety of diseases, intramuscularly with chloromycetin in amounts of 10 mg. per kg. per 24 hr. to 150 mg. per kg. 24 hr. Clinical improvement was noted in 19 patients. Side reactions were not encountered in 39 cases; local redness and infiltration was present in a one day old infant at the sites of the injections. This preparation promises to be of real value whenever chloromycetin is indicated and the drug cannot be administered by the oral route.

* This preparation was generously supplied by Parke-Davis and Co., through the kindness of E. A. Sharp, M.D.

It is clear from the data recorded in the literature and from the observations presented here that *E. coli* 055 and 0111 are closely associated with and probably responsible for epidemic and sporadic diarrheal disease of the newly born and infant; and that the broad spectrum antibiotics (aureomycin, chloromycetin, and terramycin) offer to be of real value, particularly when one considers that epidemic gastroenteritis may be associated with a fatality rate of 50 per cent. So long as a specific agent effective against the virus or viruses of epidemic diarrhea is not available and infection with bacteria, pathogenic or potentially pathogenic, such as *E. coli* 055 and 0111, is not ruled out, the practitioner may be well advised to treat severe cases of infectious gastroenteritis and patients involved in or exposed to an epidemic outbreak of this malady with one of the three broad spectrum antibiotics.

SUMMARY

1. Two serotypes of *Escherichia coli* (0111 and 055) have been recovered from the feces, nasopharynx, and throat of sporadic cases of infantile diarrhea.

2. Epidemiological, clinical, and bacteriological data presented here show that contact with and multiplication of these types of *E. coli* may be followed by an attack of diarrhea, indicating that these organisms may be considered as cause of this disease.

3. Infants may be carriers of these types of *E. coli* without history or evidence of diarrheal disease.

4. These types of *E. coli* have been recovered from the upper respiratory tract in 11 out of 14 cases, indicating that the organism may be spread to other susceptible individuals like an air-borne infection.

5. All strains of these serotypes of *E. coli* tested were susceptible *in vitro* to the broad spectrum antibiotics chloromycetin, aureomycin, and terramycin, distinctly less so to streptomycin, and were essentially resistant to penicillin and bacitracin.

6. Clinical use of aureomycin, chloromycetin, and terramycin partially suppressed or eliminated these serotypes of *E. coli* present in the intestinal and upper respiratory tracts. Concomitantly, there was clinical improvement.

7. The evidence on hand indicates that these serotypes of *E. coli* may be closely associated with epidemic and sporadic diarrheal disease of infants and that the newer antibiotics are effective bacteriologically and clinically and may prove to be of real value in the management and control of epidemics which otherwise may be associated with a fatality rate of over 50 per cent.

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Pennsylvania Plans Next Step

At the recent meeting of the Pennsylvania Public Health Association in Pittsburgh, Russell E. Teague, Secretary of Health, outlined some of the first projects to be undertaken in reorganizing the state's public health administration, as provided for under the new public health legislation. Among the projects he outlined are:

1. Establishment of a demonstration or "pilot" local health unit in Western Pennsylvania for use as a center for training professional and technical personnel for public health work. Similar pilot health units are planned for the east, northeast, northwest and central sections of the state.
2. For greater efficiency of operation, the 16 bureaus and divisions of the state department of health placed in four major sections, each under the supervision of an assistant secretary of health.
3. Inauguration of a training program for personnel in the state health department and for others to be recruited for local county or multicounty health departments.

District conferences of the Pennsylvania Tuberculosis Association, as well as county associations in various parts of the state, have held sessions devoted to the citizen's share in the new planning, stressing the fact that "public health is a coöperative effort of citizen and official agencies."

The Role of the School of Public Health in Meeting the Man Power Crisis*

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THE school of public health is a unit in a college or university established to serve the needs of higher education. The primary purpose of such a school is to be of service to those who plan a career in the field of public health practice and to add to the professional background of the candidate, an academic qualification which can be harmonized with and blended into an experiential qualification deemed essential for those who are to serve as members of the public health team. We are not here concerned with the administrative setting of the school of public health. It may be an independent unit in the university organization co-equal with engineering, law, and medicine, or it may be a department of some professional school or college. In each instance the purpose remains the same, although admittedly there are distinct advantages in giving the public health unit its independent status and prestige similar to that recommended and endorsed by this Association for state and federal health departments.

While the program of study in the school may be attuned to the needs of the official health agency at local, state, national, and international levels, it is understood that there is an equal obligation to train personnel who will serve with the voluntary health agencies and with industry. The basic principles involved in the three types of service are identical. Indeed it would be unfortunate to prepare individuals to serve in isolated compartments with no thought of interchange between the official, voluntary, and industrial health services.

For the most part students come to the public health schools possessed of varying professional disciplines. Just as in the public health team working with the official health agency, there are physicians, dentists, engineers, men of sanitary science, health educators, public health nurses, statisticians, economists, laboratorians, hospital administrators, and others. The school of public health normally plays no part in the basic professional training of the student who enters public health at graduate level. There are, of course, some exceptions to this statement in that several of the schools of public health provide courses in preventive medicine for medical schools, in preventive dentistry for dental schools, and even teach in schools of engineering and schools of education. Nevertheless the fact remains that potentially the class in the public health graduate school embraces the total vista of personnel employed by the health agency. This not only presents a complication in teaching with the need of attuning class, laboratory, and field exercises to the professional

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backgrounds of the students, but has a distinct bearing upon the problem of meeting the man power demands of the consuming health agencies.

It should be emphasized that the main purpose of the school of public health is to train the types of personnel now required and to be required by the health agencies. This naturally is not a simple matter as public health practice is in an ever-changing status. The health program has not jelled nor have we a clearly defined objective with which we can discern the needs of the future. Some would embrace in the charter of the health department all the responsibilities of government as they relate to both individual and community health, even including programs in medical care designed primarily for the individual. Others would limit the public health program to those activities which embrace exclusively community health without reference to the individual and to the family. It is our judgment that it is increasingly difficult to divorce personal health from community welfare. And the school of public health must prepare its personnel to undertake knowingly any of the public health responsibilities of the future which may be imposed upon the health agencies, this irrespective of whether the health director and his department are to be charged with the administrative responsibility of operating a particular program.

The situation is not unlike one familiar to all of us in the field of public health engineering. The health department undoubtedly is responsible for the quality, purity, and wholesomeness of the public water supply, but no one would suggest that the department engage in the business of pumping water and distributing it to the householder. There are many other illustrations that could be offered in the field of sanitation. It makes little difference who examines the building plans to determine adequacy of housing facilities in so long as standards for health conservation are reasonably applied. The health officer and the engineer have an advisory and directing responsibility which cannot be overlooked, irrespective of whether the routine examinations and inspections are made by the health department or by a building department. And so at the schools of public health we must provide for a comprehensive understanding of all features of a public health character whether they affect the individual or are applicable only to the community as a whole. The decision as to who will administer the program will usually remain with the legislative bodies whose action in turn reflects public opinion. If the health director of the future is to be charged with the administration of a medical care program, it would indeed be unfortunate for us to graduate a physician in public health without some knowledge of public health economics, hospital insurance, Blue Cross and Blue Shield programs, etc. Even though he may not be shouldered with this responsibility, he should have a discerning insight into the problems of medical care so that he may work with others who are charged with administrative direction.

In the use of the *Evaluation Schedule* as a means of determining the completeness of community health services, we have witnessed the impossibility of measuring health activities with the exactitude of a yardstick. Public health services were first developed in the United States during periods of emergency when our forefathers were harassed by the approach and devastating effect of exotic diseases, such as typhus, yellow fever, and smallpox. During these decimating epidemics the layman was quite willing that the physician and his medical society should shoulder the responsibility of stemming the spread of disease. In some states the medical society was decreed the

state board of health. A hundred or more years ago there were two procedures normally indulged in by the laity: (1) flight, and (2) prayer. There is no evidence that the latter was effective; the former served if undertaken at an early date, but not infrequently resulted in the spread of contagion to distant parts of the country. For those who looked at disease prevention in a more realistic manner, resource was had to the physician, qualified in the art of differential diagnosis and treatment, and regarded as the high priest of health. And so at an early date the physician became the directing head of our health department.

Today, with the suppression and disappearance of the communicable diseases, the need for differential diagnosis is greatly minimized, and where needed such expertness can be secured from the well trained pediatrician. The emergency health service has been superseded by a program bound together by the thread of health education which permeates all activities. Budgets, personnel management, recruitment, merit systems, and understanding of the social needs of the community, the control of the chronic diseases and gerontology have replaced the exotic diseases. Many of the old problems remain to challenge the health administrator of today and there are other problems which possess changing facets. There is an ever-maturing interest on the part of the public in stream pollution which indeed was one of the early problems for the engineer. Also there has been a new look at programs of general sanitation and problems of food service, with more and more emphasis upon health education and on outstanding coöperation of the people whom we are trying to serve.

And now we have the atom as a health problem—in peace and in war, and bacteria in war as in peace. And so we recognize old problems which are dressed in new attire and which provide new vistas for the healthman. To these changing situations the faculties in public health must ever respond in order to meet these varying needs. The school of public health must embrace in its program (1) additional training for professional people who possess the diversified backgrounds essential to the completeness of the public health team, (2) the development of a new type of personnel to meet the needs of general service in the several professional groups, (3) train a few specialists, and (4) provide continued education for those who are already employed in the health services.

The Master's Degree in Public Health represents a badge of respectability for the career man or woman in public health. It is not intended that this degree should represent a specialist in some minute area of health service, but rather should designate one who is qualified to collate the several recognized essentials * of the health program as described by our Committee on Administrative Practice and still give emphasis in some particular field, as for example public health engineering. One academic year in a school of public health can provide the basic training in statistics, public health administration, epidemiology, sanitation and laboratory techniques, and enable the candidate through electives to emphasize the areas of special interest. It would require, however, more than a single year to qualify as a specialist. The keynote of the academic year is to train the several health professions to work together as a team to serve community health needs. Increasingly the trend is toward a democratic team in which each profession has a voice in developing a public health program. All good teams need a captain and the custom continues

* Public health statistics, environmental health, health education, communicable disease control, maternal and child health, adult health, and laboratory service.

of usually electing the medical officer to this important position. And thus we encourage the appointment of medical officers of health.

Since the days of Sedgwick and his coworkers at M. I. T., attention has periodically been directed toward the training of a new group of public health people to participate in the sanitation services and even in the administrative services without the benefit of a medical degree. Such suggestions have considered the ever-changing trends and emphases in the public health program. They would concentrate the training program more directly upon the administrative problems which currently confront the health director without needless training in personal medicine which has only indirect application to community health. Some of the schools of public health are developing undergraduate programs to provide first line personnel in the fields of sanitation, nonmedical administration, health education, laboratory service, and public health statistics.

As already suggested, there will always be the need of a few specialists in the several categories of the public health services. Finally we must realistically understand that one's education is not complete on Commencement Day. There is need for sharpening the facilities with which those already employed in the health field may be kept alerted and attuned to the ever-changing vistas in health activities. Civil defense, chronic disease, the new approach to sanitation are but examples of current needs in this area.

There are several principles which should be kept in mind if the school of public health is to assist realistically in coping with man power needs. In the first place there must be a diagnosis of the problem which we are trying to solve. Only by possessing factual information, both quantitative and qualitative, can we discerningly design our teaching and recruitment programs to meet the demands of the public health services. In expressing these numerical needs the schools of public health can assist health departments, but the latter in the final analysis must define their own problems. The American Public Health Association through its Committee on Local Health Units has given us goals which in a general way serve our purpose. The Committee numerically delineated the needs for physicians, engineers and sanitarians, public health nurses, and other personnel in relation to population. Our Committee on Professional Education has expressed our views with regard to qualifications of public health personnel.

In addition, there is need of continuous evaluation of the results which we are obtaining from our educational programs and reconciliation of the teaching program to the current needs in the field. Here one cannot be satisfied with the status quo but must ever remold his curriculum to meet changing situations. Only in this manner can trained personnel be matched to the needs as expressed by the health agencies.

Another important principle which needs our serious attention is that to make maximum use of the ever-shrinking available personnel, there must be a careful redesign of the work obligations imposed upon such personnel. For example, the physician, who unfortunately is fast disappearing from the public health arena, probably for economic reasons, should be shouldered with those obligations for which he is best trained and qualified. Most physicians abhor the details of an administrative job, including budget preparation, personnel management, health education, and the like. The physician's time should be conserved so that he may perform in the area of medical service and should do those things for which his long years of preparation have prepared him. He should be unshackled

from many of the administrative details which can be more economically and effectively carried on by the nonmedical administrator steeped in the basic philosophy of health education, public administration, and the social sciences. So that we will not be misunderstood, we are not suggesting the elimination of the medical officer of health; rather are we suggesting a redesign of his work schedule and a reapportionment of his hours of service, leaving him free to do clinical, diagnostic and professional work and bring to bear under his direction the technical services of the nonmedical administrator. This may mean larger health areas and a combination of several counties into an area much larger than that recommended by the A.P.H.A. There are good administrators irrespective of their professional background. Some are found among the physicians, among the dentists, or among the engineers. And wherever the latent talent is available, it should be used so as to add to the efficiency and completeness of the public health program.

Recruitment is only in part a responsibility of the school of public health. The problem should be shared with the employing agencies. An important principle which must be considered in any recruitment program is an endeavor to blend the professional training and aptitude of the candidate into the work which is designed for him as a member of the public health team. The physician should be conserved for medical work; the engineer for engineering activities. This would make a public health career more tasty and attractive to the prospective student. The community health program is heavily weighted with medical problems, with problems of environmental health, of health education, of public health nursing, and our professional personnel must be matched so that the capacity of each profession will complement the needs of actual practice. As our programs enlarge and become more specialized, new technicians must be introduced into the field in the form of hospital administrators, nonmedical administrators, business managers, specialists in health education, and the like. In such an undertaking the school of public health can only share to the extent of its ability and initiative. The American Public Health Association, the state health departments, and the federal health services can take a commanding lead. We hear much of the need for merit systems, for adequate retirement allowances, and above all we are impressed with the urgency of paying good salaries. These are all important, especially the salary part of it. However, we will never attract personnel into the public health field until we design an appeal based upon the professional background of those whom we aim to attract. As already suggested this may require the establishment of larger health areas with district offices through which nonmedical associates, some of whom are trained only as undergraduates, may serve in activities for which they are best suited.

A cardinal principle in any program of preparation for public health personnel is to blend the academic and more formal classroom and laboratory exercises into field practice. We are not speaking of a period of residency in approved areas to be provided after graduation, but rather are we concerned with a concurrent relationship between the academic and field programs. During the year that the student is working for his master's degree, an opportunity should be afforded to spend not less than one week in one of several areas which are coördinated with the basic course in public health administration. Too frequently the scholastic year passes without an opportunity for the student to relate his academic work to the actual concurrent program in a field situation. This field exercise provides a realistic

teaching program and gives the student a sense of satisfaction in that he is being prepared for a definite situation and with a comforting feeling of his relationship to the total public health team and to community needs.

And so in conclusion it may be said that if the schools of public health are to coöperate in meeting the man power crisis, we must first take a new look at our problems of public health practice and seek a satisfying definition of what is meant by public health. Then we must reconcile our teaching programs to the field needs and match these with the professional capacity, background, and aptitude of the several professional groups who are essential to adequate performance of the public health team. All of this must be done with an appreciation of the need of continuous evaluation and reëvaluation of our program. Public health has indeed become a social science and one cannot discerningly describe its limitations or the necessity for types of personnel without a complete understanding of the community problems and how best they may be met in the effort to improve the health of man and his environment.

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The Most Important Thing

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IF at the outset I disclose that I am a neurophysiologist and will report what I have seen in my life, you may wonder how such a tale could be of interest. Perhaps I can relieve your doubts by explaining that although my field is narrow, it is concerned with something more exciting than the atomic bomb. It is concerned with the source of the atomic bomb, the human brain.

Last year, while writing a textbook on the electrical activity of the brain, I found that I was forced to travel back and forth across the whole range of things: from the electron, the smallest thing we know of, to the human brain, the most complicated thing there is. My journey started with a consideration of electrons and atomic particles; I progressed to the chemistry of batteries, and from there to single biological cells; then on to cells organized into the complex, multicellular societies we call plants and animals, and finally to the human brain. This journey extended from the subterranean regions of nuclear physics to the peaks of biological complexity; from the lowest level of material organization to a realm which is commonly considered immaterial—the region of psychic function and religion.

As I became familiar with the path, I began to look around. I realized with astonishment that the track I had followed was the spiral of evolution, the course the earth has taken and all things in it, from the earliest prehistory to the present moment. The things I saw were strange and wonderful, but they lay outside the frame of my immediate subject. I found myself writing sentences and even chapters that were inappropriate. They belonged in another book. This is that other book.

We know with reasonable certainty that some time in the distant past the matter which composes this earth consisted of unstable atoms and atomic particles. With the passage of time, these atomic particles combined into stable atoms, the atoms combined into molecules, the molecules into cells, the cells into colonies, and finally into multicellular organisms. Each of these steps involved an increase in numbers of particles in the system and an increase in organizational complexity. The number of particles in the simplest atom is two, in the simplest molecule four, in the simplest cell approximately ten thousand, and in the simplest multicellular organism one or more million. Thus our world is composed of a hierarchy of complexity, in which each successively more complex system is built up out of units from the system immediately below it in complexity. At each level of organizational complexity the system has an excess of organizing power which results in a further increase in the number of particles in the system and in the development of continually more complex systems.

At certain stages new properties arise. For example, when the level of biological complexity is reached, properties called *reproduction* appear. Much further

along in the scale of complexity, nervous systems appear which are composed of billions of complexly arranged cells and of millions of billions of highly organized particles; at this level a property appears which we call *consciousness*. With still further increases in the organizational complexity of the nervous system, remotely motivated behavior develops which we call *free will*.

Understanding, judgment, and wisdom require cerebral superstructures that are not present in lower animals. These structures develop late in evolution and also late in the life of each human being. They are feebly represented in the higher apes and practically absent in dogs. They are anatomically designated as the anterior portions of the frontal and temporal lobes. In them lie mechanisms for totalizing experience. They tell the score. When they are missing or deranged, the answer to the question, "What goes on here?" is incomplete, inadequate, or wrong. Proper functioning of the anterior portion of the temporal lobe is necessary if a man is to be a good citizen and a high quality human being. Disorders in these regions create personality disturbances and serious impairment of judgment. Unfortunately, the temporal lobes seem to have been added as an afterthought. They are attached to the brain like dormer windows. They are hazardously supplied with blood through tenuous arteries. They are protected by a thin skull and crowded against a shelf of bone. In adults, they are more commonly injured than any other higher centers. In some cases it is better to remove surgically a disordered temporal lobe than to leave it in place to act as an originator of false signals and confused behavior.

Increasing complexity does not cease with development of the human nervous system. Brains interact with brains to form societies. Looking at this process historically, it will be seen that at first, as always, the system was simple: the society consisted of single families; later of tribes; then of small nations; more recently, of great nations. Now thin tentacles of organization join nation to nation, and the beginnings of an organized world society appear. In spite of difficulties, the process will continue. Those who doubt will do well to remember that transitions to new states of organization have never been easy. The first land dwellers gasped for breath as they tried to get back into the fast evaporating water while predicting, "This is the end!"

The drift, or drive, toward ever greater complexity of social organization does not differ essentially from the general drift or drive that appears in less complex systems. Its prime requisite is interaction or communication between brain and brain. Such communication can be as close and as effective as the communication between different parts of the same brain. Vibrations of light, sound, or electricity act as bridges in space to join brain to brain and neuron to neuron. Formerly, the spoken and written word served well to link small and simple societies, but now telegraph, radio, and television have broken the space barrier. A world culture is in the process of development, and an organized world society will follow.

One of the most remarkable properties of the human brain is its power to devise and use tools, but the tool-building power of a single brain is relatively feeble compared to that of a society. Tools, in their essential functions, are but extensions of the human body. Recently, a class of tools have been developed which are extensions of the human brain itself; they calculate and think. With such equipment, man has conquered nature. He can now inflict his will on nature and alter evolution, but there is the rub. What is man's will? It is a product of his brain, a wonderful instrument to be sure, but still in many

ways defective. Its defects, externalized in human behavior and magnified in the behavior of societies, are all too apparent. With this new found power to project his will upon the universe, man stands today in mortal danger that this projection, containing his greatly amplified deficiencies, will recoil and destroy him.

Strong as man is in ingenuity, he is pathetically feeble in morality. It may sound fantastic to say that morality and good or bad social behavior are functions of the brain. It is sometimes said that the physical difference between moral and immoral behavior is too small to measure. Such a statement disregards the fact that it is now possible to split the atom, and nothing is too small to be considered. However, without delving into subatomic structure, it is clear that certain types of brain disorder can render a man hateful, and that the correction of such disorder by drugs or by removing the disordered brain area can make him a wise and good citizen. It may sound like a return to phrenology, but the fact is that there are parts of the brain which are as much "centers" of judgment, emotionality, and morality as other parts are "centers" of vision and speech.

Psychology, psychiatry, and sociology are important sciences and they have taught us much, but they have tried to deal with the function of the human brain while leaving out of account the precise manner in which the human brain functions. Because the basic information was lacking, they have been forced to explain behavior in terms of concepts. Such explanation does not really explain. At its best, it describes; and at its worst, it interprets observed phenomena in terms of fantasy. Explanation requires a transition to a lower order of complexity. Until an understanding of brain function underlies psychology, psychiatry, and sociology, these sciences will necessarily remain superficial, and weak in their powers to predict and control.

A hundred years or so ago it was a scientific postulate that an understanding of brain function was essential to an understanding of human behavior. But after scientists had made feeble efforts with crude techniques to investigate the human brain, the attack was largely abandoned; psychologists and psychological psychiatrists then took off under their own power and began to explain the "mind" in terms of behavior and to attempt to alter and control behavior with more behavior. The tactical disadvantage and ultimate futility of this approach is now becoming clear. The public is still impressed with the "wonders" of modern psychology and psychological psychiatry, but the suspicion is spreading that both have grown too big for their pants.

If a man is a brain, then what are his arms for? To do the brain's work, of course. And his heart? To bring food to the brain and carry away its waste products. And his eyes? To let the brain see. In this view, man is a brain with enough accessory organs to keep it alive and allow it to be effective. All complex human behavior is a manifestation of brain activity. Human history is a history of the brain activity of the human race. Cultures and civilizations, art and science and industry are but products of the human brain and of associated human brains. Yet this extraordinary mechanism stands in our world almost unnoticed, an invisible mountain. Why can we not see it? First, because we are too close to it—it is ourselves. Second, because we are afraid—afraid to look at it, afraid to see the queer things that reveal themselves when our eyes turn inward. We know that this is where we dwell, where the spirit dwells, and we are deeply afraid. We are afraid to look at the physical basis of psychic functions because we fear to diminish our importance. We are

like savages who will not look into a mirror because "it brings death."

We have probed the depths of space and scrutinized the interior of the atom, but we have hardly begun to explore the universe that lies between our ears. Men are wont to marvel at infinite space and at the great stretches of archeological time, but the marvel of marvels is the human brain. Contemplation of its complexity is as ennobling as contemplation of the heavens. It is the most complicated thing we know of, and yet it is packed into a space smaller than a portable typewriter.

How much does our civilization care about the brain? In our museums of science and industry, where human knowledge and achievements are placed on grand display, where transportation and communication are given hundreds of feet of space, where airplanes hang from the ceilings and radar flashes along the walls, there is no exhibit on the human brain. In our museums of natural history, where the forms and habits of animals are contrasted and man is given his proper lofty place in the evolutionary scheme, there is nothing to indicate that it is man's brain that makes him different. The casual visitor is likely to come away with the notion that it has something to do with distribution of hair or the bony configuration of the face. Our schools teach little or nothing about the brain, and our colleges less. Our medical schools give vastly more attention to accessory organs.

The general public is as ignorant about the functions of the brain as was the cave man. Children shown a picture of a man being hit on the head with a sledge hammer laugh. They are encouraged to addle their own brains with repeated concussions in such sports as football and boxing. Boxing commissioners wonder out loud why pugilists die in the ring. Our modern literature is full of references to people being revived by a procedure which is almost pure magic—pouring water on the face. Newspaper articles weep over boys and girls or men and women who have lost a leg or an arm, perhaps both legs and both arms, but they say nothing of those who are really maimed, those with brain injuries. Folk attitudes are vestiges of what once were highly informed opinions. Only three hundred years ago the experts were not sure that the brain was the organ of the mind. Popular opinion about the brain is still clouded by the antique theory of humors. The heart for many is still the home of the soul.

If the brain is the most complicated, most interesting, and most important thing in the world, if it is man's master instrument, it would seem that the study of the brain should be the chief concern of civilized man. Instead, the average man, the educator, the psychologist, the psychiatrist, and the average scientist act as though the brain did not exist. Can this be remedied? Yes, but only by raising a generation that realizes the importance of the brain. What the brain does, how it does it, should be shown in textbooks and museum exhibits. Medical students should be taught all that is known about the functional anatomy of the brain, and when they have learned it, they should not be told that they can forget it again because mental disease is produced by experiences and improper reactions to experiences. We should develop a large-scale scientific attack on the brain, recruiting the most talented of each generation for this purpose. We have done so before in other fields; for example, in electricity and chemistry. These were fostered by profit, but there is profit also in brain research. Millions of persons in this country have brains which function so poorly that human kindness and the simplest kind of community self-interest require that something be done to help them. They are a burden to themselves and a source of sorrow to their friends and relatives. Even the

niggardly provisions that are made for them cost the nation billions of dollars each year. One out of every ten persons in this country spends part of his life in a mental hospital. Cannot an "industry" be founded on such a need—an industry as big, perhaps, as the liquor or cosmetic industry?

How will we benefit if this is done? A great increase in knowledge of the brain and a consequent development of applied neurology, or brain engineering, would produce more than a reduction in the amount of mental disease, for the diseases from which patients in mental hospitals suffer shade off in minor forms into the "normal" population. As we discover how to eliminate severe disorders, we will learn to reduce and eliminate minor disorders. This may allow us to rise to new cultural heights; we may even be able to develop a new type of civilization. Does this sound fantastic? Not when regarded in the light of past experience. Commerce and the association of peoples was greatly aided by the control of plague and yellow fever. An infinitesimal increase in social responsibility, a decrease in paranoia, and an increase in benevolence would modify our whole social structure.

If a society is looked upon as an aggregate of brains and each brain as an aggregate of neurons, a society is then an aggregate of neuron aggregates. It seems reasonable to suppose that the study of the mechanisms by which coarse, erratic, irrational, and essentially purposeless behavior spreads through a neuron aggregate has meaning not only for the individual brain but also for the interconnected brains of a society. The elimination of the waves of crude antisocial behavior that sweep our society from time to time is no less a possibility than the elimination from a single nervous system of the waves of primitive behavior which result in an epileptic seizure. This latter possibility is now, as a result of brain research, a probability attainable in eight out of ten cases.

Admittedly, the science of the brain and brain engineering is at the present time only in its infancy. It is at the same stage of development as were electrical science and engineering in 1892, at the time of the Columbian Exposition. The first lights have been turned on, but if the full possibilities of brain engineering are to be realized, our efforts must be immensely expanded. If we can borrow from our strength to support our weakness, from our hypertrophied ingenuity and cleverness to support our feeble judgment and control; if we can find out how to make the human brain work more reasonably and smoothly, there is hope that we may correct our defects and learn to stabilize our explosive society.

In this presentation, nothing has been said of religion. It might be assumed that the general attitude underlying these remarks is irreligious. It is not. That there is an organizing principle will be evident to anyone who looks at the course of history and prehistory. If no plan is seen, there is at least inescapable evidence of an unfolding. Development has proceeded to a point where we discern the main outlines of the process. It does not consist merely of an increase in the size of our present level of organization, a spatial extension of the status quo. Because we have human brains we cannot escape the role of conscious actors in the evolutionary process. We have the power to make world-shaping decisions, and we make such decisions even if we decide to do nothing. The big question, the question for the cosmic jack pot, is this: Are our brains good enough to assist in the next step of organization? Can we learn how to change, or will we hold to the status quo though it means either gradual or sudden extinction? Our power to change and to develop higher types of organization is at present rudimentary, but there is a great range of abil-

ities in mankind. Let us hope we will follow the best. All men are created equal, we say; by this we mean, of course, that each has the same face value, but the real value differs. If we can improve the brains of those who are deficient in the highest and most desirable human characteristics, if we exert ourselves to make all brains the equal of what a human brain should be, we will change. Whether this will be enough none can tell—we can at least try.

Those gifted with the cerebral equipment to sense the general shape of a master plan—and they are by no means all scientists or intellectuals—need little help from neurology or brain engineering. They are the saving remnant; they organize and move forward as though by instinct. Those who need help are the vast majority with poorly developed higher centers that see things, not from the godlike point of view of man at his best but from the narrow view of less highly endowed creatures.

What is the universal adhesive force, the agglutinator, the organizing principle? Primitive people called it God. Intellectuals have called it the something-not-ourselves that makes for rightness or righteousness. Christ called it Love. He personalized and illustrated it so dramatically and with such poetic force that He made it clear to millions who would not otherwise have understood.

Religion has grown, as other things have grown, by fits and starts, with much withering of dead branches. Religious leaders have erred as scientists and all human beings have erred, but what is right abides and continues to grow. It will grow faster and spread out to include a larger portion of the universe when man becomes wise in his knowledge of God's master instrument—the human brain.

Illinois' Fluoridation Standards

The Illinois State Health Department has developed a set of standards on the basis of which it will approve a program for the fluoridation of water supplies of a community. The standards as summarized are:

a. A genuine public desire for this treatment.
b. Responsibility for this treatment understood, both as to possible personal hazards to the operators and as to the possible toxic effects from overdosing.
c. Local water works conditions making possible the addition of fluorides with reasonable control, maintenance, and operation.
d. Engineering plans and specifications for fluoridation facilities have been submitted to the State Department of Health for approval.

A Conservation of Hearing Program for School Children

Review of Three Year Experience in Harford County, Maryland

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IN December, 1950, our hearing program had been in operation for three years. From following individual cases, we knew that many children had been helped. It then seemed advisable to review the entire experience so as to determine what our accomplishments had been.

This paper describes the screening process in the schools, referral to the clinic, and the method of operation of the clinic. There is an account of the number of cases seen, the degrees of hearing loss, and types and probable causes of loss. There follows a description of successes and failures in getting treatment carried out as recommended, and a comparison of improvement of hearing in some treated and untreated cases.

HISTORY

The program was started in February, 1948, as a joint project of the county Departments of Education and Health. The stimulus was provided by the respective state departments, under whose sponsorship similar programs had been set up in several other counties. The clinic likewise had the endorsement of the county and state medical societies.

PROCEDURE

Most of the children seen in the clinic with probable hearing defects were found in the schools by audiometric testing.* The Board of Education technician devotes full time to vision and hearing testing. Theoretically, all children entering the 1st, 3rd, 5th, and 7th grades are tested, and retested every two years as they progress from 1st to 3rd grades, etc. Children in the 8th to 12th grades are tested only by request of physician, parent, teacher, or nurse† (grades: Elementary—1st to 6th, Junior High—7th and 8th, High—9th to 12th).

The parents receive a letter from the technician stating whether their child has passed or failed the test. In the latter case, the parents are advised to have the child examined by their own physician or at the clinic.

The clinics are now held monthly during the school year, in one of three health department clinics. They are held on a school day, from 10 a.m. to 4 p.m. Children and parents are offered transportation in school buses, when necessary. If the parent does not attend, she must sign a slip permitting examination of the child. Parents are urged to attend whenever possible.

Every child is examined by the

* Screening procedure: Each child is tested individually with a pure tone audiometer. The child's hearing is considered abnormal if he has a loss greater than 15 decibels for any of the tones 256, 512, 1,024 2,048, 4,096 and 8,192; or a loss greater than 20 decibels for the half tones 2,896 and 5,792.

† For further discussion, see paragraph No. 2 under Findings.

clinician, a Baltimore ear, nose, and throat specialist in private practice, who is paid per diem by the State Health Department. The examination consists of a history, an inspection of the ears, nose, and throat in all cases, and a nasopharyngeal visualization when indicated. The technician attends the clinic and does audiometric retests when necessary. Three public health nurses and a health department secretary complete the clinic staff.

Radium treatment is given at the clinic by the clinician with the assistance of the nurses, after a permission slip has been signed by the parent. The radium is supplied by the State Department of Health.

For T & A and other treatments, the child is usually referred to the family doctor. Recommendations for treatment are given verbally to parents in attendance. In addition, the health department sends a note to the parents, describing the findings in nontechnical terms and advising treatment. A technical note is sent to the family doctor. Follow-up visits to the parents to urge carrying out of recommendations are made in many cases by the nurses; some visits are made to the family doctors.

Families able to pay are supposed to make their own arrangements for treatment. With this in mind, after the initial clinic visit, a note is sent to the family physician asking him to state any objection to the child's returning to the clinic. In a few cases, the physician has stated that the family could well afford private care, and the case has not been readmitted.

The health department assumes the responsibility of arranging treatment for indigent and medically indigent cases. These persons may apply for medical care under the state program. They may then be treated by most physicians at office or home, at state expense. Indigent persons may apply to the County Welfare Department for payment of inpatient hospital bills. The department will also certify some medically indigent persons.

The Harford Memorial Hospital accepts about three children every week for T & A's, as service cases. Appointments are made by nurses, after the family has obtained the Welfare certificate, or if the family has hospital insurance. In cases not eligible for Welfare help, and without insurance but needing assistance, the American Legion has paid all or part of the cost.

After the recommended treatment has been accomplished, the child returns to the clinic for reëxamination. Most cases are not discharged from clinic supervision until normal hearing is found or further improvement is deemed impossible.

The clinician has usually not reëxamined children who have not been treated as recommended. The technician in most cases, however, has retested elementary school children as they have progressed from 1st to 3rd, 3rd to 5th, and 5th to 7th grades.

FINDINGS

1. *Screening tests and clinic admissions*—The school population from 1948 through 1950 was approximately 10,000. Of these, some 7,000 children have been tested at least once since 1948. About 14 per cent, or 1,018, failed the screening test and were referred to their family physician or to the clinic; 941 of these children were admitted to the clinic.

2. *Age distribution and source of referral of clinic admissions*—Nine hundred and eighty-nine of the 995 clinic cases were school children; 610 were age 5 through 11 years; 379 age 12 through 18 years. Only 4 were preschool children, and 2 were adults (Table 1).

Ninety-four per cent of all the cases were referred through school screening. Of these, 355 were 12 through 18 years. Two hundred and sixty-five of this older group were in grades 8 to 12 when first

TABLE 1

Number of Patients Admitted to Clinic, by Age, School Status, and Source of Referral

Referred by	No. of Patients Admitted (All Ages)	Preschool Children (5 years)	School Children (5 through 11 years)	School Children (12 through 18 years)	School Employees (Adult)
All sources	995	4	610	379	2
School screening	941	—	586	355	—
Teacher-nurse conference	43	—	21[b]	22	—
Family physician	5	2[a]	2	1	—
Parent	3	1	1	1	—
Self	2	—	—	—	2
Unknown	1	1	—	—	—

[a] One child, age 2
[b] One child, age 9, never attended school because of deafness

tested and should not have been given the school test according to the original schedule. However, in 1948 and early 1949, the technician tested many complete classes in the junior and senior high schools. Judging from the number of children found with hearing defects, this deviation from schedule seems a wise one in the first year of a school program.

3. *Degree of hearing loss at admission* —This was determined from binaural audiometry, using the standards shown in Table 2. Most children were tested at the clinic on admission; in the remainder, the record of prior school screening was used. Excluding 15 cases in which the audiometry was not recorded, 980 were distributed as follows: normal or very mild loss, 11.2 per cent; mild loss, 59 per cent; moderate, 22.2 per cent; severe and extreme, 7.6 per cent.

The normal reading is theoretically 0 decibel loss for each of nine tones with each ear. The customary margin of error allows for readings as normal up to 15 decibel loss, particularly when the tests are not done in soundproof rooms. A child with a reading of 20 decibels or more for one tone has a very mild loss, but this one tone aberration has been considered within the range of error and the child has been classed as normal.

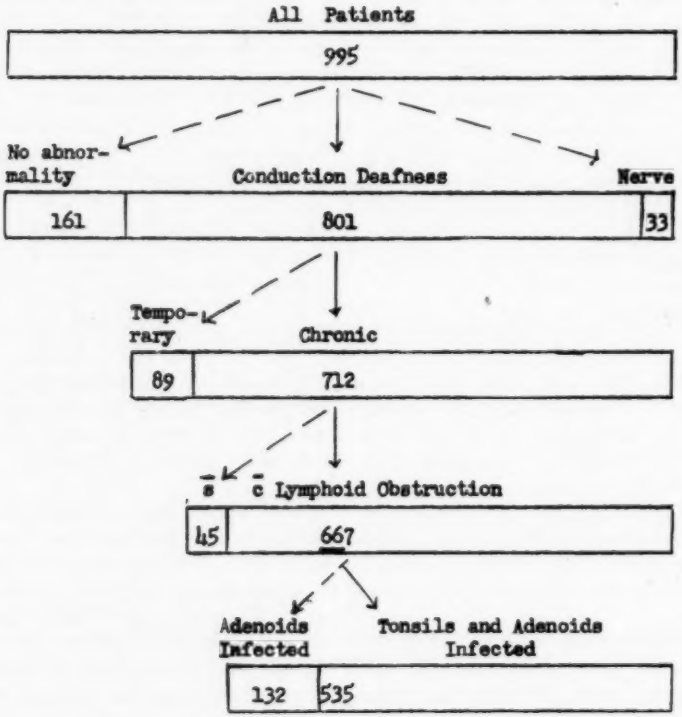
4. *Probable causes of hearing loss and associated clinical findings* (Figure 1).

TABLE 2

Degree of Hearing Loss of All Patients on Admission to Clinic. Binaural Pure Tone Audiometer Readings at School Screening or First Clinic Visit

Degree of Loss	Audiometry, Both Ears: Number of Tones Abnormal	Audiometry, Both Ears: Decibel Loss, Each Tone	Number of Cases	Percentage of 980 Cases with Known Degree of Loss
All degrees	0–18	0–110	995	100.0
Normal or very mild	0 or 1	20 or more	110	11.2
Mild	2 or more	20 or more	578	59.0
Moderate	4 or more	30 or more	218	22.2
Severe	6 or more	40 or more	47	4.8
Extreme	8 or more	50 or more	17	2.8
Unknown	Reading not obtained, not recorded, or not satisfactory			

FIGURE 1—Major types of hearing loss, and associated clinical findings. Number of patients in each group.



No Significant Abnormality—161 Cases

Most of these children had normal hearing when they were tested at the clinic on admission or subsequently. Some had a mild loss. Clinical examination of the ear, nose, and throat revealed no abnormality.

Conduction Deafness—801 Cases

Temporary hearing loss due to wax and acute upper respiratory infections accounted for 89 cases. The remaining 712 had chronic deafness, associated with a history of previous upper respiratory infections in all but 24 having miscellaneous conditions.* Hyperplastic lymphoid nodules (adenoids) in and around the orifices of the Eustachian tubes, producing partial obstruction of the tubes and obstructive deafness, comprised the clinical diagnosis in 667 cases. In those with infected tonsils, the adenoid obstruction was observed by nasopharyngoscopy in 45 per cent and inferred in 55 per cent. In those whose tonsils and adenoids had been removed before examination at the clinic, the presence of obstructive residual or recurrent adenoid tissue was established by nasopharyngeal examination in 90 per cent and inferred in 10 per cent. Twenty-four children with chronic otitis

* Nasal allergy, deviated septa, foreign bodies, and stenosis of external auditory canal.

media, mastoiditis, and sinusitis had sufficient cause for conductive deafness without adenoid involvement.

Nerve Deafness—33 Cases

There were 28 cases of definite nerve deafness, of which 12 also had conductive deafness associated with previous upper respiratory infections. (Nine of these showed lymphoid obstruction: 6 from infected tonsils and adenoids and 3 from infected adenoids.) One case was due to previous trauma and 2 were congenital. In 13 cases of definite nerve deafness, the type and cause were not determined. Five cases were recorded as probable nerve deafness and were not further investigated.

5. *Treatment — Recommendations made and recommendations carried out*—There were 834 children with conduction and nerve deafness; 751, or 91 per cent, were advised to have some treatment. (See Figures 2A and 2B.)

Seven hundred and eighty-two treatments were recommended. Our records show that 403 treatments were done and 256 were not done.* We have no information about 123 treatments ("lost cases") because the children had graduated from school or moved from the county, or because the information was not recorded.

* Types of treatments: T & A, radium, wax removal, medical treatments (for nasal allergy, acute upper respiratory infection, chronic otitis media, chronic sinusitis, and eczema of ear canal), adenoidectomy, rehabilitation (lip reading, hearing-aid and auditory training, speech therapy), minor surgery (dental surgery, foreign-body removal from ear and nose), and major surgery (mastoidectomy, plastic operation for stenosis of external auditory canal and for septal obstruction).

FIGURE 2A—Number of treatments known to have been done, by type of treatment.

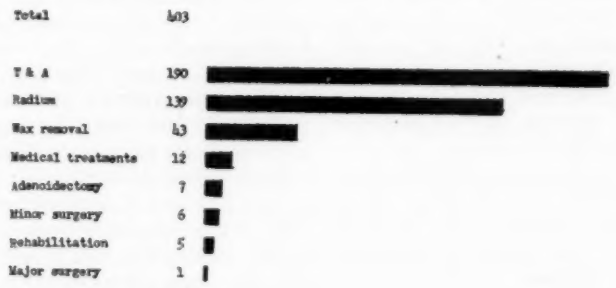
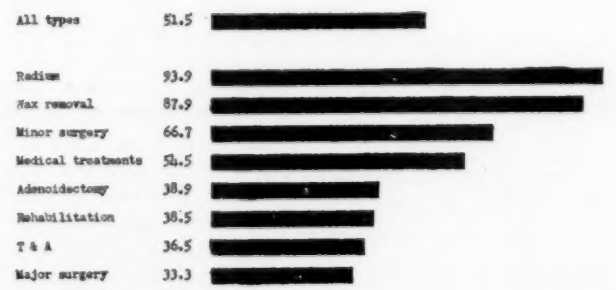


FIGURE 2B—Per cent of recommendations known to have been carried out, for each type of treatment.



On the basis of the treatments known to have been done, at least 51.5 per cent of the recommendations were carried out. If we assume that in the lost cases treatments were done at the same rate as among those we know about, we may add 51.5 per cent of 123, or 63, to the 403 known as done. The corrected number of treatments done then becomes 466. This gives us a percentage of accomplishment of 59.6. The true percentage of recommendations carried out, therefore, lies between 51.5 and 59.6.

6. *Time to accomplish treatment*—The time interval between recommendation and accomplishment of treatment was approximately the same for all types of treatment. Calculations indicated that other treatments were done slightly faster than radium, with T & A slowest; but the differences were not significant. Fifty per cent of all types were accomplished at 5.0 months (the median), and 75 per cent at 9.7 months (3rd quartile). The accomplishments fell off as expected, with 56 per cent of treatments completed in the first 6 months, 79 per cent in the first year, and 97 per cent by the end of the second year.

7. *T & A—Recommendations made and carried out—(T & A alone, T & A and secondary adenoidectomy, T & A and radium: for conduction deafness and for conduction-nerve deafness)*—Five hundred and thirty-five children had infected tonsils and adenoids and were advised to have them removed. One hundred and ninety, or 36.5 per cent, were known to have done so, 227 did not have them removed, and there is no information in 103 cases.

The degree of hearing loss at time of recommendation is shown in Table 3, for those who did and did not have the operation. Inspection of the table indicates that those with a greater degree of hearing loss were more likely to have the operation performed.

Reasons for Nonaccomplishment

No attempt has been made to tabulate the reasons for nonaccomplishment, and in many cases the real reasons are not known. However, the following remarks taken from the nurses' notes may be of interest. In cases where the parents could pay for T & A, reasons given were: "The parents were not interested (for reasons not expressed) . . . . they were afraid of the operation . . . . they did not think the hearing loss was important . . . . they thought the child would grow out of it . . . ." In a few cases: "The family physician did not think the operation was indicated."

One may ask whether these treatments were not done because the child's hearing improved and therefore the parents felt no necessity for treatment. Against this possibility is the fact that usually hearing loss was brought to the attention of the parent by the technician and clinic, very few requests for initial testing having been made by the parents. Especially in the milder cases, the parents could not themselves judge

TABLE 3

Correlation: Degree of Hearing Loss at Time of Recommendation, and Subsequent Performance of T & A

Degree of Hearing Loss at Time of Recommendation	*Percentage of Cases in Which T & A Done*	*Number of T & A Recommended*	*Number of T & A Done*	*Number of T & A Not Done*
Extreme	55.5	9	5	4
Severe	61.9	21	13	8
Moderate	48.1	108	52	56
Mild	44.6	251	112	139
Normal or very mild	21.8	23	5	18

whether their child's hearing had improved.

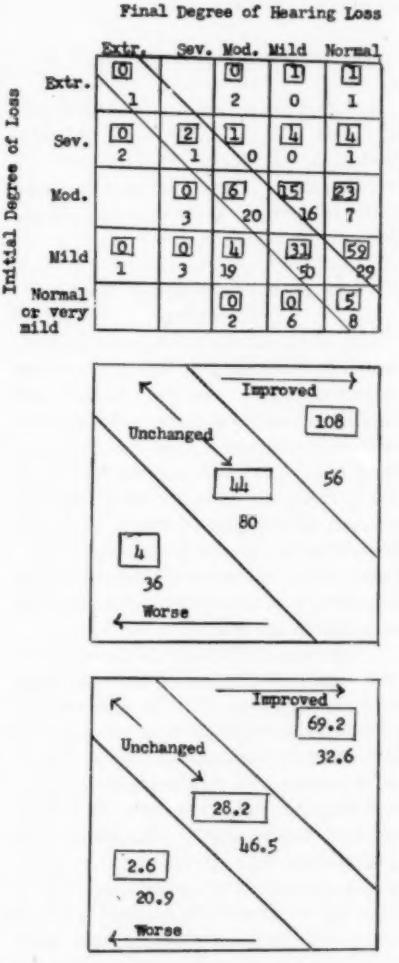
8. *Treatment by T & A alone for conduction deafness* (Figure 3)—In 156 children who had their tonsils and adenoids removed, we have audiometer readings before and after treatment. The initial reading in some cases was obtained from the school screening, which occurred from 1 to 4 months before the first visit to clinic. In most cases, the initial reading was obtained at the clinic at the time recommendation for treatment was made. Using the median figure (50 per cent of the cases), the T & A was done 5.8 months after recommendation and the final reading was obtained at clinic or school 14.7 months after treatment.

A "control" group of 172 children who did not have their tonsils and adenoids removed is available for comparison. The initial reading was obtained in the same way. However, these children were told not to return to the clinic, and the final reading was obtained at the school. (Children up to the 7th grade were tested routinely. Those in the 8th through the 12th grades were tested from January to March, 1951, at the request of the authors.) The median figure for final reading was 25.9 months after recommendation.

The treated and untreated groups were roughly comparable in respect to sex, color, place of residence and school, and socio-economic status. There was a higher percentage of younger children in the treated group, but this made no significant difference in respect to improvement (see age differentials, paragraph No. 14). They were practically the same as regards initial degree of hearing loss. Thus, cases with moderate loss made up 28 and 27 per cent of the treated and untreated groups, and cases with mild loss constituted 61 and 60 per cent of each group, respectively.

The statisticians would prefer two groups selected by the alternate case

FIGURE 3—Change in degree of hearing loss, in cases for whom T & A recommended for conduction deafness.



[4] Boxed upper figure = number of cases treated with T & A.

4 Unboxed lower figure = number untreated.

[156] Total number of cases treated with T & A.

172 Number untreated.

[100] Percentage of treated group.

100 Percentage of untreated group.

method, i.e., the first child told to have a T & A, the second child told *not* to have a T & A. This can hardly be done in a public health school clinic.

Improvement With and Without Operation

In the treated group, 69.2 per cent improved, 108 of 156 cases. Without treatment, 32.6 per cent improved, 56 of 172 cases. This difference in favor of the treated group is obviously significant. (See Figure 3.)

Worse Hearing With and Without Operation

In a clinic for the prevention of deafness, it is important to find out whether untreated cases become worse and whether this can be prevented by treatment. (See Figure 3.) In the untreated group, 20.9 per cent became worse, 36 of 172 cases. This occurred in only 2.6 per cent of the treated cases, 4 of 156. This difference is also highly significant. Figure 3 also shows the change in degree of hearing loss for each treated case and each untreated case.

9. *Radium treatment—Recommendations made and carried out (Radium alone, radium and T & A, radium and secondary adenoidectomy: for conduction, and for conduction-nerve deafness)*—There were 135 children with obstructive adenoids, whose tonsils had been removed before clinic admission. All were advised to have radium. In addition, the treatment was advised for 13 children without obstructive adenoid tissue, who had early conduction deafness, high tone loss, history of frequent colds, chronic otitis media, or chronic sinusitis. Of these 148 children, only 8 did not receive the treatment as recommended, and information was not recorded for one. The percentage of recommendations carried out was 94 (Figure 2B).

Each application consisted of the exposure to 50 mgm. of radium given through the standard nasopharyngeal applicator of 0.3 mm. monel metal, with an exposure time of 12 minutes on each side of the nasopharynx.

The number of radium applications recommended and given varied from 1 to 6, the most frequent being 3. These applications, of necessity, were given at monthly intervals, though the optimum interval is 2 weeks.

The 8 children who did not receive treatment all graduated or moved from the county and were lost from observation.

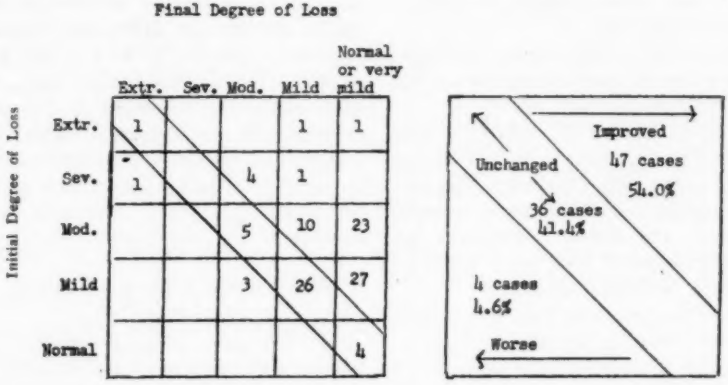
10. *Cases treated with radium only, for conduction deafness* (Figure 4)—There were 87 children with audiometer readings before and after treatment. The median time for completion of treatment (1 to 6 applications) was 6.0 months after recommendation. This high median figure is accounted for by the fact that permission for treatment was often secured after the recommendation was made. Also, clinics were not held during the summer months. The median for final readings was 14.1 months after treatment.

No change in degree of hearing loss, before and after treatment, was found in 41.4 per cent, or 36 of the 87 children. Improvement after treatment was noted in 54 per cent, or 47 children. Worse hearing was noted, in spite of treatment, in 4.6 per cent, or 4 children.

With the evidence of improvement of hearing without treatment in the T & A group, it seems unfortunate that we have no control group of children inadvertently or purposely untreated with radium. Though radium has been used for the purpose described for 25 years,[1] apparently no controlled study has been reported. It is still needed.

11. *Secondary adenoidectomy alone, for conduction deafness*—This treatment was advised when the amount of lymphoid tissue in the nasopharynx was too massive for beneficial effect from the established "safe" dosage of radium.

FIGURE 4—Change in degree of hearing loss before and after radium treatment in 87 cases of conduction deafness.



As in the group treated with radium, this lymphoid tissue appeared after T & A (completed before clinic admission) either because of incomplete removal, or through regrowth induced by repeated or chronic upper respiratory infections.

Obstructive, infected large adenoids were found in 18 children, and removal was advised for 13. The operation was performed in 4 instances.

12. *Combined treatments for conduction deafness (T & A followed by radium, or secondary adenoidectomy followed by radium)*—This group includes 15 children whose hearing was not improved by T & A done on the recommendation of the clinic. After reëxamination, radium treatment was advised and completed on 12. Half improved and half remained unchanged. The median time interval from initial to final audiometry was 24 months.

However, in some of these 15 children radium was advised, even though adenoidectomy was the treatment of choice. It was considered highly unlikely that the parents would accept a second operation, since it had taken constant urging by the nurses, for as long as a year, to get them to accept the original operation. In fact, of 3 secondary adenoidectomies advised, only 1 was done.

Some of the 25 other children who did not improve after a T & A were rechecked at the school. The parents then said they would go to the family doctor rather than return to the clinic. The remainder were seen at the clinic and told to return for reëxamination. But in the meantime, they graduated from school or moved out of the county.

13. *Nerve deafness*—Types and probable causes have been described in paragraph No. 4. Treatment for conduction deafness was advised for 9 children who also had nerve deafness and was completed in 6. None showed any improvement.

Nine children were referred to the Johns Hopkins clinics (7 with nerve deafness, type undetermined; 2 with conduction-nerve deafness) and 8 went, of whom 6 were seen at the Hearing and Speech Center. There, hearing aids were advised for 5 children and 4 were obtained along with auditory training. Lip reading was advised for 6 children but only taught to 1. Speech therapy was advised for 2 children but was not obtained.

14. *Significance of differences be-*

tween younger and older age groups—Significant differences which were not due to chance were found for the following items (See Table 4):

Extreme and severe degree of hearing loss was found more frequently in the older children, as expected.

Chronic conduction deafness with lymphoid obstruction was found less frequently in the older children. This may be accounted for by gradual adenoid shrinkage, and lessened lymphoid hyperplastic response to upper respiratory infections, with increasing age.

Nerve deafness was more frequent in the older group, as expected.

T & A's were done more often in the younger children, for reasons not determined, but as expected.

For the following items, differences found could be explained by chance, so that we may conclude there was no essential difference in the younger and older groups: Radium treatment was completed in 92 and 96 per cent of each age group, respectively, indicating that if the treatment is made convenient for parents and children, it will be accomplished. Improvement in hearing was similar for younger and older children, with and without T & A, and with radium. This finding for the untreated cases was not as expected, since it was believed that the hearing of older children would improve spontaneously as the adenoid tissue shrank. This points to the necessity for treatment of older children.

COMPARISON WITH WASHINGTON COUNTY STUDY

"In February, 1943, a program for the prevention of deafness in children was started in Washington County, Maryland. This was the first program of its kind, with an emphasis on medical treatment, financed by the Children's Bureau and conducted by a health department as one of its services for crippled children." [2]

In 1948 and 1949, a series of articles describing the administrative and clin-

TABLE 4

Significance of Differences Between Younger and Older Age Groups

	Item	*Per cent Difference, Younger Group Compared to Older*	*5 through 11 years*		*12 through 18 years*	
			Per cent	*Number*	*Per cent*	*Number*
Difference is significant *	Extreme and severe hearing loss on admission	4.2 less	5.7	36/614	9.9	38/381
	Lymphoid obstruction	9.9 more	70.8	435/614	60.9	232/381
	With infected tonsils and adenoids	17.4 more	60.4	371/614	43.0	164/381
	With infected adenoids	7.5 less	10.4	64/614	17.9	68/381
	Definite nerve deafness	4.4 less	1.1	7/614	5.5	21/381
	T & A done as recommended	14.2 more	41.0	146/356	26.8	44/164
Difference not significant †	Radium given as recommended	2.4 less	92.3	72/78	95.7	67/70
	Improvement in hearing					
	With T & A	4.6 more	70.2	87/124	65.6	21/32
	Without T & A	7.5 more	35.1	40/114	27.6	16/58
	With radium	16.7 more	61.7	29/47	45.0	18/40

* Probability of occurrence by chance less than 0.5%: P = 3.0 or more

$$P = \frac{\text{Observed difference in percentage}}{\text{Standard error of difference}}.$$

† Probability of occurrence by chance more than 10%: P = 1.5 or less.

ical aspects of the program was published by Proctor and his associates.[2-4]

Since this program was the model on which our own was based, and since Proctor's reports on such a program are the only ones to be found in the literature, a comparison of the Washington County and Harford County programs is indicated. As shown in Table 5, we duplicated Proctor's findings for the following items:

1. Conduction deafness was twenty times as frequent as nerve deafness.
2. T & A was the most frequently recommended treatment.
3. Radium treatment when recommended, was almost always carried out.
4. Improvement to normal hearing occurred in about one-third of cases treated with radium.

Differences between the two programs, as shown in Table 5, were as follows:

1. The Washington County program was a broader one, in that many preschool children and adults were seen. Forty per cent of their referrals were from private physicians.
2. They found only half as many school children with hearing loss, out of the same number screened.
3. They recommended radium treatment for three times as many children.
4. They were twice as successful in getting T & A's done.
5. They obtained improvement to normal hearing after T & A less than half as often.

SUMMARY AND CONCLUSIONS

1. Since February, 1948, 70 per cent of the children in the Harford County schools have been screened for hearing defects by audiometry.

TABLE 5

Comparison: Washington County and Harford County Programs

	Item		*Washington*	*Harford*
Similar:	Number of children screened at schools in 3 years		7,615 (1944–47)	Approx. 7,000 (1948–50)
	Patients admitted to clinic in 3 years		1,004	995
	Ratio of conduction to nerve deafness found		20 to 1	20 to 1
	T & A recommended, number of patients		463	520
	Radium given as recommended		100%	94%
	Percentage of cases improved to normal with radium		34%	34%
Different:	Frequency of clinics and radium treatments		Every two weeks	Every month
	Age distribution of patients	Preschool	17%	0.4%
		School children	73%	99.4%
		Adults	10%	0.2%
	Source of referral	School screening	27%	94%
		Teacher-nurse	26%	4%
		Private physician	42%	0.5%
	School children with hearing loss confirmed at clinic after screening		350	800
	Radium treatments recommended, number of patients		461	139
	T & A done as recommended		68.5%	36.5%
	Percentage of cases improved to normal with T & A		21%	56%

2. Of 7,000 children tested, 1,018 (14 per cent) failed the test; 941 of these were seen in the clinic; and 54 others were referred for examination, mainly through teacher-nurse conferences.

3. The majority of 995 clinic patients had a mild loss of hearing; but 7.6 per cent had a severe or extreme loss when first seen.

4. Chronic conduction deafness was found in 712 patients (72 per cent), nearly all associated with previous upper respiratory infections. Partial obstruction of the Eustachian tubes from infected (tonsils and) adenoids was present in 535; from infected adenoids alone in 132.

5. Nerve deafness was found in 33 patients; 12 of these also had conduction deafness.

6. One hundred and ninety T & A's were done—36 per cent of the number recommended; 139 children received radium treatment—94 per cent of those recommended.

7. In patients for whom a T & A was done on our recommendation, 69 per cent showed improvement in hearing. A similar group which did not have the T & A as recommended showed only 33 per cent improvement. Hearing became worse in 2.6 per cent of patients after T & A, in contrast to 20.9 per cent among those who declined a T & A.

8. Of those treated with radium, 54 per cent showed improvement of hearing. No control group of untreated patients has ever been available for comparison. Such a comparison is still needed.

9. Improvement in hearing (and regression) was similar for younger and older children, with and without treatment. This finding was not as expected, since it was believed that the hearing of older children would improve spontaneously as the adenoid tissue shrank. This points to the necessity of treatment, rather than waiting.

ACKNOWLEDGMENTS: The authors are indebted to William G. Hardy, Ph.D., and Edward Davens, M.D., for critical suggestions in the preparation of the manuscript.

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Preliminary Report of Histoplasmin and Other Antigen Sensitivity in North Carolina*

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RECENTLY, it has been noted that chest roentgenograms from the Mass X-ray Survey in North Carolina show sectional differences in the incidence of multiple calcifications such as Palmer [1] and Christie [2] described and related to histoplasmin sensitivity. Casual testing for histoplasmin sensitivity in this state had yielded a very low percentage of reactors and this was regarded as an area where histoplasmin sensitivity was low and of little interest. Palmer [3] tested 241 student nurses from the states of North Carolina, South Carolina, Georgia, and Florida and found that only 2.8 per cent reacted to histoplasmin. Gass, *et al.*,[4] in Tennessee have previously shown that in an area with a high rate of pulmonary calcification a large proportion of persons with such lesions have a negative tuberculin reaction and therefore the calcification is probably due to some disease other than tuberculosis. The observations made on Mass Survey films by the Tuberculosis Section of the North Carolina State Board of Health, however, suggested that in certain areas the incidence might be much higher and clarification of this issue seemed indicated.

The problem was approached by skin testing with histoplasmin antigen of (1) the patients in the three state tuberculosis sanatoria, (2) a group of individuals previously identified in the Mass Survey as having pulmonary calcifications, and (3) an unselected group of inhabitants from a county known to have a high incidence of pulmonary calcifications. Dr. Norman Conant and Dr. D. T. Smith of Duke University suggested that the survey might be widened to include tests with coccidioidin and blastomycin.

SOURCE OF MATERIAL AND TECHNIQUE

Histoplasmin (lot H-40) freshly diluted 1:1,000, and blastomycin (lot B-7) diluted 1:1,000 were obtained from Dr. Arden Howell of the U. S. Public Health Service Mycological Laboratory. Coccidioidin diluted 1:100 was obtained from Dr. Norman Conant, and the PPD was a Parke-Davis product diluted to an intermediate strength so that 0.1 ml. contained 0.0001 mg. of PPD. This material was given intradermally in the usual manner within 48 hours after it was diluted and the reaction was read in 48 hours. The induration in millimeters was measured and recorded.

FIRST SURVEY

The patients in the sanatoria were tested with histoplasmin, blastomycin, and coccidioidin. PPD was not used

* Read before the North Carolina State Tuberculosis Society, May 22, 1950.

FIGURE 1

in this survey. The majority of the sanatorium patients in this state were long residents of the counties from which they were admitted. Those patients who had spent a considerable length of time outside of North Carolina were rejected from the survey. Accordingly, we had an unusually stable group for testing. The total found suitable by virtue of their residence was 925. Of this number, 48 were found to have a positive reaction to histoplasmin antigen, or 5.1 per cent. This is somewhat higher than Palmer's[3] figure of 2.8 per cent for this general area. However, when North Carolina is analyzed by sections, there are marked and significant differences in the percentage of positive reactors, and it is this regional variation that is of interest. There were, in the sanatoria, representatives from every county in the state except three, thus giving us a fairly good representation from the state as a whole. (Figure 1 shows a map of the state divided into seven sections. Samples from each of these sections consisted of 98 or more persons tested.)

The highest reactions to the histoplasmin skin tests were in the northeastern area bounded by the westernmost borders of Northampton, Bertie, Martin, and Beaufort counties. A total of 98 sanatorium patients were tested from this area, and 15 per cent showed a positive reaction to histoplasmin. This is in contrast to other sections of the state, notably the north central and south central areas, which varied between 0.9 per cent and 1.3 per cent reactors. The section that showed the next highest percentage of reactors was in the western area, where 6 per cent of the sanatorium patients were positive to histoplasmin. This area is bounded on the east by Ashe, Watauga, Caldwell, Burke, and Rutherford counties. The Statistical Department of the North Carolina State Board of Health is of the opinion that this percentage variation is significant.

Emmons[5] has recently shown that *Histoplasma capsulatum* has a saprophytic existence in the soil of endemic areas and he has isolated the organism from animals that live in these areas. Although the relationship of histoplasmin sensitivity in the human being to the presence of the fungus in the soil has not been proved, the evidence is suggestive. Accordingly, a geologist from North Carolina State College in Raleigh was consulted. The northeastern sector of North Carolina and the seashore line of the southeastern section are approximately 25 feet above sea level. The soil is of a fine, silty loam and is exceedingly fertile. It is quite

retentive of moisture and there is poor drainage in this area due to the low elevation. The rainfall averages about 50 inches a year. The *p*H. of the soil varies from 5.0 to 5.5. The majority of the population in this area live on farms and therefore have a close relationship with the soil. Due to the poor drainage and fairly high rainfall, the soil in this area is moist most of the time.

The western part of the state, wherein 6 per cent of our survey patients showed a positive reaction, also has a high rainfall and the soil is moist most of the year. By way of comparison, the mountain areas of Tennessee are similar in terrain, soil, and climatological conditions and they also have a fairly high percentage of histoplasmin reactors. The highest percentage in Tennessee, however, is in the Mississippi Valley region, which may be said to correspond to the North Carolina Coastal Plain region. Both of these areas have soil of exceedingly high fertility that is retentive of moisture. It is to be understood that the relationships involved are on a conjectural basis.

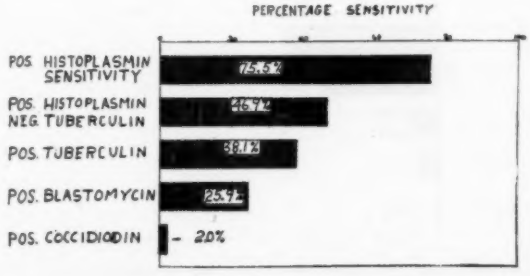
Of the sanatorium patients tested, 10 showed a positive reaction to blastomycin. Five of these patients with positive tests to blastomycin also showed positive reaction to histoplasmin of more than 10 mm. induration. One sanatorium patient, who had never been out of the state, showed a positive reaction to coccidioidin and did not react to other antigens. This test was repeated, with similar results.

It was felt that further, more detailed studies should be made, particularly within the area of highest reaction.

SECOND SURVEY

Beaufort County, which is in the northeast coastal section, was selected for study of skin sensitivity to four antigens: histoplasmin, blastomycin, coccidioidin, and tuberculin (See Figure 2). One hundred and forty-seven patients who had shown pulmonary calcification on previous Mass Survey films were tested, and 76 per cent showed a positive reaction to histoplasmin of 5 mm. or more induration. Thirty-eight per cent showed a positive tuberculin reaction to PPD. Twenty-six per cent showed a positive reaction to blastomycin, and all of these also reacted to histoplasmin, usually with more than 10 mm. of induration. Two per cent showed positive reaction to coccidioidin. Some of the residents of Beaufort County showed a very marked reaction to histo-

FIGURE 2.- PERCENTAGE HISTOPLASMIN AND OTHER ANTIGEN[1] SENSITIVITY IN 147 INDIVIDUALS TESTED WITH PULMONARY CALCIFICATION: BEAUFORT COUNTY, 1950



1. ANTIGENS: TUBERCULIN (PPD), COCCIDIOIDIN, AND BLASTOMYCIN

plasmin, giving as much as 26 mm. induration, with pronounced vesiculation and with erythema extending to 75 mm.

Several of these cases were persuaded to undergo retesting in order to get pictures of the reaction. It was observed that most of them showed less marked reaction on retesting. The interval between the two tests was five months and the strength of the material and the technique were the same.

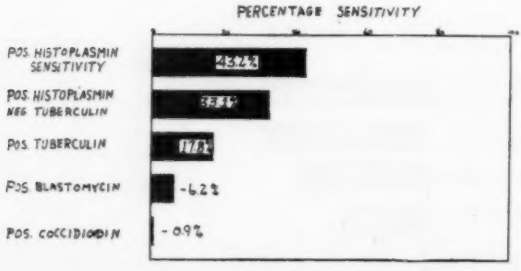
THIRD SURVEY

Since the survey in Beaufort County was made on patients selected on the basis of pulmonary calcifications, it was thought advisable to test an unselected group in this area of high reaction. Accordingly, Hyde County, which adjoins Beaufort, was selected. This county is on the Pamlico Sound, and its soil is extremely fertile. It is a low, flat country, poorly drained, and is predominately a farming, fishing, and hunting section. A total of 338 persons, representing both Negro and white and most age groups, was considered. The persons tested were picked at random, with no preliminary screening. The same four antigens were used. Of the 338 tested, 43 per cent showed a skin reaction to histoplasmin of 5 mm. or more induration. The population ratio of colored persons to white in the county is about 1½:1 and the persons tested were in that ratio; however, there was no significant difference in reaction as to race (Figure 3).

There was very little sex difference, although the females had a slightly smaller percentage of reactors. Parsons and Zarafonetis,[6] on the contrary, found a marked sex difference in their study, with 3½ times as many males as females reacting in all age groups and 7 times as many males over 10 years of age. Included in the North Carolina survey were a number of school children, and the mean age of all those tested was 17 years. Of those above 20 years, 46.8 per cent showed a positive histoplasmin test. One hundred and twelve, or 33 per cent, were found to have negative tuberculin and positive histoplasmin reactions. Four-and-seven-tenths per cent were positive to blastomycin, and the majority of these were associated with histoplasmin sensitivity of 10 mm. induration or greater. This may have represented cross-reaction. Coccidioidin tests revealed only 0.9 per cent reactors.

Subsequent chest x-rays of the posi-

FIGURE 3 - PERCENTAGE HISTOPLASMIN AND OTHER ANTIGEN[1] SENSITIVITY IN 338 INDIVIDUALS TESTED[2]: HYDE COUNTY, 1950



1. ANTIGENS: TUBERCULIN (PPD), COCCIDIOIDIN, AND BLASTOMYCIN.
2. 338 INDIVIDUALS SELECTED AT RANDOM FROM THE GENERAL POPULATION.

tive reactors were made by Dr. W. A. Smith of the State Board of Health, but no active cases of histoplasmosis were revealed.

SUMMARY

1. North Carolina has a higher percentage of histoplasmin reactors than was formerly thought. Five per cent of 925 sanatorium patients from 97 counties reacted to histoplasmin.

2. Regional differences to histoplasmin sensitivity are marked. They varied from 0.9 per cent in the north central section to 15 per cent in the northeastern section.

3. Larger scale studies were made in counties in the northeastern section. Studies in Beaufort County revealed that 75 per cent of 147 patients with pulmonary calcification reacted to histoplasmin. Studies in Hyde County showed that 43 per cent of 338 persons chosen at random reacted to histoplasmin.

4. Pulmonary calcification among positive histoplasmin reactors in Beaufort County was similar to that described by others and related to histoplasmin sensitivity.

5. Further study and skin testing to histoplasmosis is indicated in North Carolina.

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International Neurologists' Panel

The National Multiple Sclerosis Society has taken the lead in organizing a Panel of International Corresponding Neurologists. Its purpose is "to establish liaison throughout the world with physicians and scientists interested in the problems of multiple sclerosis." A total of 56 neurologists from 26 countries comprise the present panel, whose membership will be expanded with representatives from other countries.

Headquarters of the panel are at the National Multiple Sclerosis Society, New York City. Medical director of the society and founder of the panel is Cornelius H. Traeger, M.D.

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THE SEVENTY-NINTH ANNUAL MEETING

THE Annual Meeting at San Francisco (Oct. 29–Nov. 2) formed one more solid link in the chain of historic meetings which have marked the progress of the public health sciences since 1872. It was held in what—to many of us—is the most charming city of the United States. It was made pleasant by the many courtesies of our California hosts; and it was made profitable for the more than 4,000 delegates who attended by a program of unusual richness. In this program the Western Branch of the Association and more than a score of other organizations in fields related to ours participated.

At the First General Session, Governor Earl Warren delivered the John J. Sippy Memorial Lecture on Public Health for an Expanding Population, a notable address, which will be published in the January issue of the JOURNAL; and a most distinguished series of Lasker Awards were made.[1]

At the annual banquet, Dr. W. P. Shepard delivered his presidential address, a moving appeal for more wholehearted coöperation of the medical practitioner with the public health profession in its difficult tasks (printed in the November issue of the JOURNAL); and the twenty-first award of the Sedgwick Memorial Medal "for distinguished service in public health" was made to Dr. E. S. Godfrey. His thoughtful planning and indomitable courage have marked him as one of our most outstanding health administrators; and his personal modesty and zealous integrity have made him as beloved as he is respected.

A departure from precedent—justified by the emergent issues of global policy involved—was a special evening general session on International Health in which we were favored by addresses from Dr. Brock Chisholm, Director-General of WHO, from two of the Regional Directors of that organization (Dr. Mani and Dr. Soper), from Dr. van Zile Hyde, U. S. representative on the WHO Executive Board, and from Dr. F. G. Boudreau, Director of the Milbank Memorial Fund and Chairman of the Steering Committee of the National Citizen's Committee for the World Health Organization, whose establishment he formally announced. All these papers are presented in this issue of the JOURNAL.

The three major standing committees of the A.P.H.A. (on Administrative Practice, on Professional Education, and on Research and Standards) held long and fruitful sessions, the R & S committee celebrating its twentieth birthday.

The most significant papers presented before our thirteen Sections will be published in this and future issues of the JOURNAL. Epidemiology provided contributions of special interest on the Coxsackie virus, on histoplasmosis, on the effect of atmospheric disinfection by glycol vapor, on the effect of injections on site and severity of paralysis in subsequent attacks of poliomyelitis, on the treatment of rabies, and on tuberculosis. A symposium on the challenge of an aging population, discussions on the problems of rehabilitation and on defenses against biological warfare aroused wide interest. The Public Health Nursing Section provided a symposium on Developments and Adjustments in Public Health Nursing Service which was replete with sound and constructive suggestions, and the School Health Section presented an unusually valuable series of papers. The Medical Care Section staged five highly stimulating symposia of its own aside from coöperation in several joint sessions.

We look back to the San Francisco meeting with pride and appreciation; and we look forward to a Cleveland meeting in 1952 with hope and confidence.

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[1] *A.J.P.H.* 41, 12:1546–1549 (Dec.), 1951.

ANOTHER CHALLENGE TO THE HEALTH OFFICER

WHEN the writer began his professional career as Assistant Health Officer in a small New Jersey town half a century ago, the problems of the Health Department were relatively simple. We responded to complaints of nuisances. We placarded and fumigated (with sulfur!) in cases of communicable disease. We were quite modern for those days for we operated a laboratory and made bacterial counts on milk, although the supply of glassware was so limited that pipettes and dilution bottles had to be sterilized between each two samples.

Today all this has changed and—worse yet—is continuing to change, and at a rapid pace. No sooner has the Health Officer got used to chlorination than he must master the principles of fluoridation. No sooner has he learned to organize an x-ray program than he is confronted with multiphasic screening. Mental hygiene services and programs for the chronic diseases of later life present new and perplexing problems.

A recent issue of the New York State Health Department monthly bulletin (incidentally one of the most perfect examples of format and typography prepared by any health organization) offers a new challenge to the health administrator, that of Narcotic Addiction. Dr. K. W. Chapman, of the U. S. Public Health Service,[1] presents an admirable review of this important subject. He discusses the factors of emotional instability which so often contribute to drug addiction and the increasingly serious psychic disturbances which follow such addiction. He emphasizes, in particular, the seriousness of use of narcotic drugs among young people, beginning with smoking of marijuana "reefers," then inhaling heroin, and finally injecting it by needle. Experience at the U.S.P.H.S. hospital at Lexington, Ky., indicates a substantial improvement during treatment of such cases; and Dr.

Chapman concludes that "given adequate guidance and counseling in their home communities after discharge from the hospital" the affected children "should stand a good chance of becoming useful citizens."

Here is where the local health agencies of the community must take over. Dr. Chapman's program deserves serious study by other public health workers; and its results will be followed with keen interest as such services develop.

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1. New York State Department of Health, Albany. *Health News* 28, 8:3 (Aug.), 1951.

DIETARY HABITS OF BALTIMORE BABIES

WE always turn to the *Baltimore Health News* with interest, for Dr. Huntington Williams is likely to provide a stimulus to thought. A recent issue [1] contains a report on lead poisoning in children which is a case in point.

During the past 21 years (1931–1951), the Baltimore records show 293 cases of lead poisoning in children, with 83 deaths. An average of over ten cases and four deaths a year seems to represent a real health problem.

Most of the children affected were in their second year of life and the monthly incidence shows a sharp (and unexplained) peak in the month of July. As to causation, the report states that the teething children usually lived in "old rented properties where lead paint had been used for many years in window sills and frames and where it had often flaked and scaled. Investigation most often revealed that the children chewed the window sills or picked up the paint flakes and put them in their mouths." With the knowledge * at our disposal, this seems a reasonable explanation. To prevent additional hazards in the future, the City Health Department has added to its Hygiene of Housing Ordinance the provision that "no paint shall be used for interior painting of any dwelling or dwelling unit or any part thereof unless the paint is free from any lead pigment."

The question naturally arises whether babies brought up in the shadow of "the Hopkins" develop peculiar alimentary tastes not common elsewhere. If such is not the case, perhaps other health officers have been missing something.

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1. *Baltimore Health News* 28, 113 (Aug.–Sept.), 1951.
* The Managing Editor wanted to spell this word "gnaw-ledge"; but the suggestion was not accepted.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

The Conservation of Ground Water—*By Harold E. Thomas. New York: McGraw-Hill,* 1951. 321 pp. Price, $5.00.

Dr. Harold E. Thomas presents an up-to-date survey of the gound water situation in the major underground reservoirs of the United States. He shows that pumpage of ground water for irrigation is substantially in excess of ground water draft for all other uses of the nation. Basic data have been taken from authentic sources of information.

Representative problems which have been encountered in getting water into and out of underground storage and complex physical, economic, and legal factors involved in ground water developments are given in an understandable manner. Important fundamentals, not all-inclusive, of ground water hydrology are interspersed through the book. The problem and examples of solutions are illustrated from results of many studies made by agencies and individuals in 35 states.

The author adroitly handles the subject of controversial land use practices. His comments on case histories cited could give no offense to agencies attempting to justify certain practices by hiding behind the strange cloak of water conservation.

The book emphasizes the rapidly increasing water demands of the nation, the growing importance of conservation of the quality as well as quantity of the ground water supplies, and a crying need for competent investigations to provide a basis for integration of ground water resources with surface water in comprehensive basin developments. Requirement for better ground water management is stressed, but the manner of accomplishment is rather vaguely indicated in generalities. The author expresses an easy-to-read message which could do much toward sounding an alert to the pyramiding need for water conservation.

T. R. SIMPSON

Diabetes Control—*By Edward L. Bortz Philadelphia: Lea and Febiger,* 1951. 260 pp. Price, $3.50.

This manual, intended as a guide for diabetic patients, will prove most helpful to the busy physician as an aid in instructing newly discovered diabetic patients, both young and old, and those who are returning for treatment. The book is a convenient size, well printed, and the text is written clearly and simply.

The author discusses the control of diabetes because the most recent investigations show not only that the well known complications of diabetes can be controlled but that some of those degenerative complications, long feared, now seem on their way to a better understanding and even to postponement and prevention. The life expectancy of the diabetic patient has tremendously increased and it has become evident that many of the complications are readily preventable, provided diabetes is discovered early and adequately treated. Therefore, the author emphasizes the program of early diabetes detection initiated by the American Diabetes Association and so thoroughly approved by the American Medical Association. He performs a real service in emphasizing once again that the control of diabetes means not merely freedom from symptoms but means that the basic

metabolism in the tissues of the patient must be regulated by proper diet and the use of insulin if the long-run complications are to be avoided.

The discussion of the etiologic factors in diabetes is simplified. The treatment of the young diabetic, and especially the place of summer camps in the life of the growing diabetic, is described and well illustrated. The problems of pregnancy, the care of the mouth and teeth, and surgery in diabetes are well discussed. Instructions for the administration of insulin are clear and concise.

The author, long known for his interest in the promotion of medical investigation and research, has given a considerable amount of space to simplified descriptions of the present status of investigations, of the relationship between the lipids and arteriosclerosis, of the new methods of Dr. John Gofman, and of the earlier work dealing with the pancreas. The book is recommended highly. HOWARD F. ROOT

Hope and Help for the Alcoholic—*By Harold W. Lovell. New York: Doubleday,* 1951. 218 pp. Price, $2.75.

This book does an excellent job of presenting alcoholism to the lay reader in terms which anyone can understand. Dr. Lovell does not oversimplify the problem. He deals fairly with all the methods of treatment used at the present time, although he places the greatest emphasis on a combination of the Alcoholics Anonymous program and adrenal cortical hormone (ACE) injections. In attempting to offset past overemphasis on psychoanalysis, he may tend to give it less credit than it deserves, although he consistently points out the supplementary value of psychotherapy in combination with other forms of treatment. I agree with his statements, "We never see an alcoholic who is simply sensitive to alcohol, yet has no neurotic symptoms at all; we never see an alcoholic who is simply neurotic without any sensitivity."

It is largely a question of emphasis. As a psychiatrist I tend to give more weight to emotional or psychogenic factors and I feel that understanding and insights are necessary before the compulsion to drink can be overcome, while Dr. Lovell stresses the role of metabolic factors in alcoholism and their correction by ACE rather more than I would. Nevertheless, both points of view are well expressed, and I consider this one of the best popular books on alcoholism I have read. It is highly readable and holds one's interest throughout. I wish that the families of all alcoholics, as well as the alcoholics themselves, could read it. RUTH FOX

Air Pollution Control—*By Stanley Scott and John E. McCarty. Berkeley, Calif.: Bureau of Public Administration, University of California,* 1951. 38 pp. Price, $1.00.

This report, prepared at the request of California legislators, discusses air pollution generally in the United States, but with special emphasis on present conditions in California. Following a listing of the many sources and substances giving rise to air pollution, it emphasizes "the profound influence upon air pollution" of topographical and meteorological factors. It recognizes that California has a "climatic predisposition towards air pollution." In discussing the effects of air pollution, it points out that evidences of health effects, except in obvious cases, such as the incidents at Donora, Pa., and the Meuse, Belgium, are suggestive rather than conclusive. On the other hand, the nuisance effects and the economic losses, including damage to crops and livestock, are positively established.

The authors are on sound ground in stating that simple public nuisance abatement attempts are of limited value in the control of air pollution. Under a smoke abatement program, which is the method of attack in a number of

cities, main reliance is placed on the adoption of a prohibitory ordinance. This is generally limited to the prohibition of smoke emission above a specified density for more than limited periods of time, although frequently dusts, fumes, and noxious gases are included in the prohibition. The criticism is made that ordinances are often not effective because of failure to attack the basic cause, namely improper combustion of fuel; and also because of the many exemptions frequently provided, and because an adequate enforcement staff is not available. Instances where broad smoke abatement programs have been effective are presented, including those in St. Louis, Mo., and Pittsburgh, Pa. Reference is made to the growing trend to have smoke abatement programs become county-wide, and of recent years, even state-wide in coverage. States where action in controlling smoke and air pollution has recently been taken or is now under active consideration include California, Minnesota, Maryland, New Jersey, New York, Wisconsin, Utah, Oregon, and Illinois.

The comprehensive air pollution control program of Los Angeles County, which is demonstrating some success in a most difficult and troublesome situation, is described. The inclusion of a separate research division in that county's administrative setup no doubt played a significant part in the achievements of the program.

Anyone taking part in efforts to establish a smoke abatement or air pollution control program or engaged in administrating such a program would do well to study this report. It contains an exceedingly clear presentation of the multifold aspects of this problem, concern with which is rapidly spreading among health officials and the general public. SOL PINCUS

Alcoholism and Social Stability: A Study of Occupational Integration in 2,023 Male Clinic Patients —*By R. Straus and S. D. Bacon. New Haven: Hillhouse Press,* 1951. vii pp. plus 30. Price, $.50.

Medical and psychiatric experience has shown in recent years that a more hopeful prognosis and a greater rehabilitation potential exist in those patients whose alcoholism appears later in life. This is especially true in patients who have a prealcoholic history of reasonable personal integration and adjustment. Viewing the problem from the perspective of sociology, the authors, members of the Yale Center of Alcohol Studies, observed the same phenomenon.

In their study of some two thousand male patients from nine outpatient clinics, moreover, they present data on what they believe to be a "hitherto unrecognized segment of alcoholics who display a relatively high degree of social and occupational integration"—based on the large proportion of them who were married and living in an established household, gainfully employed, etc. In fact, the degree of social stability is so startling as to suggest—if the negative is an index of one's alcoholism—that these are not alcoholic patients, certainly not alcoholics in the sense that their drinking has either seriously impaired their normal personal and social functions or become in itself a way of life.

The core of this study presents important descriptive data on *some* alcoholics who are a far and impressive cry from the popular concept of the derelicts which many harbor. These data are seriously weakened, however, by such unqualified and sweeping summary statements (incidentally, appearing throughout the text, also) as "This segment of alcoholics . . . is perhaps the most significant element in the entire alcoholic populations," and, "The extent to which these alcoholics are seeking the services of the few available community clinics . . . indicates the important role which such clinical facilities are playing

in the over-all approach to the problems of alcoholism."

Such statements notwithstanding, this study can be read with profit by all interested in the problems of alcohol. Aside from its informational value, it marks out an area of research which needs further and continuous investigation.

JOSEPH HIRSH

Group Leadership and Democratic Action—*By Franklin S. Haiman. Boston: Houghton-Mifflin,* 1951. 309 pp. Price, $2.50.

Many people in many places and with varied interests have been talking about leaders, leadership, and democratic action. It is quite obvious that the terms have different connotations for different individuals and groups. For this reason *Group Leadership and Democratic Action* represents a major contribution to the literature on a most important subject.

The author has attempted to bring together the philosophical-scientific background and the practical techniques of democratic leadership. The principles and values of authoritarianism and democracy and how leadership may function within these processes are carefully analyzed. The author's success in developing the concept that the difference between democracy and autocracy is not sharply defined but one of degree is thought-provoking.

In the section dealing with the skills of democratic leadership, not only are the requirements of effective leadership discussed, but it is pointed out that it is not the exclusive concern of one individual to provide such service to a group—that in a democratically operated group, the person who can most conveniently and effectively render this service should be turned to by the group.

There is a signiñcant theme which runs throughout the book and is summarized by the author in the final paragraph: "Wherever people live and work together there will be leadership, and the destiny of the group will depend in a large part upon the kind of leadership it has. . . . As we move forward to still deeper insights and discover better training techniques we can reasonably hope to achieve a state of affairs in which democratic leadership will be more than an academic theory."

ROBERT YOHO

Help Yourself Get Well—*By Marjorie McDonald Pyle. New York: Appleton-Century-Crofts,* 1951. 235 pp. Price, $3.00.

This is an excellent book—for the patient with tuberculosis before and after recovery, for his family and friends, and for the doctors and nurses who care for him, as well as for everyone interested in public health. Its excellence largely stems from its taking into account the emotional reactions of the patient and their effect on his progress. Never having had tuberculosis myself, I asked a friend of mine who is a physician and has been a tuberculosis patient to read it and give me his opinion; he also thought it excellent.

Probably the weakest chapter is that on rehabilitation—a matter to which everyone pays lip service but about which very few do anything. The chapter on famous people who have had tuberculosis retells several hackneyed success stories which add little to the book. But these are small flaws and unimportant.

The suggestions for self-discipline, for using time to good advantage albeit on one's back, for learning to read profitably and enjoy music, are topnotch. Particularly good is the idea of getting pet peeves out of one's mind by writing them down in detail; friends have told me that they tried this with good results. Having time to read and think may make a great difference in one's later life; a few months ago a man told me

that the six months he spent in a sanatorium gave him a chance to get his philosophy of life reoriented so that he could see his way more clearly in our present chaotic world.

If you know someone who has broken down with tuberculosis, by all means see that a copy of this book gets into his hands as soon as possible.

ALAN L. HART

Modern Dietetics—*By Doris Johnson. Edited by Hazel Munsell. New York: Putnam,* 1951. 529 pp. Price, $4.95.

Modern Dietetics was designed to serve as a text for the student nurse. The central theme of the normal diet is used to present the subject of dietetics in a practical manner. Because of the wide scope of the book, the author has limited herself to fundamental facts without including details which would make the text more useful for public health workers. This same effort to cover too many subject matter areas has resulted in a less stimulating and vital book than a reader might wish.

The first part of the book is designed to meet the requirements of the three courses in nutrition, cookery and diet therapy, and the special services of pediatrics and obstetrics in the curriculum of schools of nursing. In Part One, normal nutrition is considered through discussions of proteins, carbohydrates, fats, minerals, vitamins, water, and cellulose. In addition, there are chapters on planning an adequate diet, food economies, nutrition education, food habits, and the nutrition of various age groups. Part Two, the treatment of disease by diet, is related to the normal diet in terms of consistency, energy value, protein, carbohydrates, fats, mineral content. Part Three deals with the care, selection, preparation, and cookery of foods and was written to correlate with the author's *Laboratory Manual for Cookery*. Part Four includes methods of calculating food values and tables on food values, sodium and potassium content of foods, percentage of major mineral elements in food, food value of alcoholic beverages, heights and weights, composition of blood and urine. Thought-provoking questions supplement every chapter and pertinent bibliographies follow several. A general bibliography is included in the appendix.

To the public health nutritionist, the tables found in the appendix will provide a convenient single reference for valuable and frequently used material. To those in public health interested in nutrition education for nurses, this book will be helpful as one of several references.

CATHERINE M. LEAMY

Problems of Infancy and Childhood. Transactions of the Fourth Conference, March 6–7, 1950. *Edited by Milton J. E. Senn. New York: Josiah Macy, Jr. Foundation,* 1951. 181 pp. Price, $2.25.

The Conference, of which this volume is a verbatim report, was intended as a forum for the discussion of certain questions of interest to the staff of the Fact Finding Committee of the Midcentury White House Conference. Three subjects were presented for discussion to a group representing the fields of pediatrics, obstetrics, psychiatry, psychoanalysis, anthropology, nursing, public health, and education. The subjects were: (1) Cultural Determination of Parental Attitudes, presented by the anthropologists Murdock and Whiting; (2) A Consideration of Some Problems in the Ontogeny of Family Life and Social Adjustments in Various Infrahuman Animals, presented by Schneirla, of the American Museum of Natural History; and (3) Working Toward Healthy Personality, presented by Lawrence K. Frank.

The book deals with basic issues in the field of behavior. The first two presentations cover a good deal of new

material in their respective fields, and the third is an interesting and thoughtful summary of present-day strivings in the field of parent education and child rearing. The anthropological report is based on cross-cultural studies now being conducted at Yale and Harvard. The presentation on animal behavior is an extremely stimulating discussion of the theory of trophallaxis, or environment-organism interaction, in the unfolding of patterns of behavior in animals.

The round table discussion following the presentations is lively, stimulating, and of sustained interest. The book is well worth the attention of anyone interested in source material in the field of behavior. JULES V. COLEMAN

Clinical Laboratory Methods—*By W. E. Bray (4th ed.). St. Louis: Mosby,* 1951. 614 pp. 119 text illus. Price, $7.25.

This is the fourth edition of a text stated by the author to have been "the outgrowth of long experience in teaching clinical diagnosis to medical students." Like all books of this nature, it suffers from weaknesses inherent in an approach which attempts to combine methodology and medical interpretation within one set of covers. The medical phases, which are outside the province of laboratory science *per se,* are not covered by this reviewer, who is a chemist.

For use as a guide to clinical laboratory methodology, this book will be misleading to all but the beginner in medicine, to whom a rough approximation of the facts may be sufficient. Errors occur with astounding frequency. A few examples will suffice:

P. 49—The instructions for Benedict's test for sugar in urine read to boil five minutes in a water bath instead of three minutes, which is the true equivalent of the two minute boiling time over a flame recommended by Benedict. This error is now universal in texts of this type and is the cause of countless false diagnoses.

P. 53—The Scott-Wilson method, the only specific test for acetone in urine, is not mentioned.

P. 103—The Tallquist method for hemoglobin in blood is given, without mention of Wintrobe's statement that "it is grossly inaccurate."

P. 477—The Kahn verification test, stated to be of no value in the 1949 edition of the U. S. Public Health Service pamphlet on syphilis, is given as a procedure "to detect biologic false positives."

P. 555—The formula for Exton's reagent is given as containing 10 gm. sodium sulfate (grade not specified) per liter, instead of 50 gm. of the anhydrous.

It is obvious that for serious use in laboratories in which objective facts are sought by methods selected for scientific correctness, texts such as this are of little value. Used as guides by those with insufficient training in fundamental science, they are the source of potential danger. As example of such danger, the facts revealed in the Belk-Sunderman evaluation of hospital laboratories in Pennsylvania may be cited. Specimens containing 60 mg. glucose per 100 ml. were reported by 4 laboratories of the 59 participating in the survey to contain 333, 363, 444, and 571 mgm., respectively. Such results immediately bring to the experienced director's mind the conclusion that photoelectric methods were used without adequate understanding of the instrument and its possible fallacies. Yet neither in Dr. Bray's text, written since this survey, nor in the original report of Drs. Belk and Sunderman, is any mention made of the possible errors through the use of such methods under direction of personnel unacquainted with the scientific principles of photoelectric colorimetry. MEYER SAMSON

Mental Hygiene—*By Lester and Alice Crow (2nd ed.). New York: McGraw-Hill,* 1951. 433 pp. Price, $4.50.

Since mental hygiene is an aspect of

all human activity rather than a separate and distinct body of knowledge, it is a particularly difficult subject to present in textbook form. This work, like many textbooks, shows overcondensation of material, lack of specific information or background data, a preponderance of general dogmatic statements, and a certain lack of spontaneity which makes for dull reading.

The most interesting portions of the text relate to the hygienic adjustment of the developing person and mental hygiene in relation to school functions and personnel. This reflects the fact that the authors are educators, and the book is apparently written for the use of students in education.

A consulting expert in matters medical and psychiatric could have prevented misleading and inaccurate statements. Psychosomatic medicine, for example, is used as though it meant the medicinal therapy of disorders such as organic mental disease due to syphilis. There is a statement that schizophrenia may be caused by malnutrition of the brain tissue and elsewhere malnutrition is listed as the cause for speech defects.

Each chapter concludes with a list of questions for discussion useful for teaching, and the bibliographies are adequate and fairly well selected. However, the book cannot be recommended for use by independent students, though an instructor who could give selective assignments from the text could amplify or interpret the material present.

BARBARA KORSCH

Color Atlas of Morphologic Hematology—*By Geneva A. Daland. Cambridge, Mass.: Harvard University Press,* 1951. 74 pp. Price, $5.00.

This volume represents a systematic presentation of blood cells in health and disease, reflecting the attitudes of the Thorndike Memorial Laboratory at the Boston City Hospital where leadership has been outstanding through Drs. Francis W. Peabody, George R. Minot, and William B. Castle.

The purpose of the *Atlas* is declared to be to furnish a guide for reference in the study of films of peripheral blood stained with Wright's stain. The maturation of the blood cells is very well described and is shown in the diagrams and the plates in such a way that the relationships between bone marrow and peripheral blood can readily be understood.

The authors and publishers are to be congratulated on an excellent text beautifully presented, and the American Cancer Society (Massachusetts Division) has performed a public service by making publication possible through a special grant. The volume is highly recommended.

REGINALD M. ATWATER

Nutrition Fronts in Public Health—*By Icie G. Macy, Benjamin H. Ershoff, Clive M. McCay, et al. New York: National Vitamin Foundation, Inc.,* 1951. 168 pp. Price, $1.50.

The title of this book has been appropriately chosen. The six subjects discussed, Nutrition and Maternal Health, Factors Conditioning the Development of Malnutrition, Nutrition as a Factor in Aging, Influence of Nutrition on Work Performance, Nutrition and Resistance—Susceptibility to Infection, and Nutritional Factors and Hormones in Stress Reactions, are presented in a comprehensive yet condensed form and are well documented. In this reviewer's opinion, the chapter on Factors Conditioning the Development of Malnutrition is particularly appropriate at this time in that the greater share of severe malnutrition in these United States is of this type, rather than primarily a deficiency of food intake.

This book is recommended to health officers and practising physicians alike and is a must for all nutrition workers.

HAROLD R. SANDSTEAD

The Better Half of Your Life—*By Charles H. Lerrigo. New York: John Day Company,* 1951. 270 pp. Price, $3.50.

Out of a rich experience of more than half a century in the general practice of medicine and a concourrent career in the field of public health, this physician has written a book of practical usefulness and singular felicity of style. It would be a mistake to catalogue Dr. Lerrigo's latest contribution to health education solely as further publication in the field of geriatrics. It is that, but it is much more.

One cannot proceed very far into the 270 pages of *The Better Half of Your Life* without realizing that a wise, kind, and cheerful doctor is talking to you as he would in the privacy of his office. He is speaking of getting on in years and the concomitant physical and mental situations one is apt to encounter along the way. He illustrates his observations by personal experiences of 79 years of well rounded living.

Specifically, 20 physical impairments are discussed in the book along with observations on such topics as "Exercise After Forty," "Worry and Anxiety," "High Blood Pressure," "Sleep Habits," "Hobbies," "Retirement," and "Recreation." The author brings the reader up to date on the most recent medical knowledge in the areas of greatest interest to men and women who are "getting on in years." Practical problems of the aging, such as hearing-aids, care of the skin, diminishing eyesight, and what to do upon retirement are handled with skill and knowledge of the resources available in these and related fields.

While this book is primarily addressed to an aging audience it would be profitable reading for everyone who has attained the right to vote. Dr. Lerrigo's personal charm and sense of humor, added to sound knowledge and a rare literary style, are compounded into this volume which will richly reward all who read it. FRANK KIERNAN

How To Retire and Like It—*By Raymond P. Kaighn. New York: Association Press,* 1951. 149 pp. Price, $2.50.

Here is a good Christmas or birthday present for a friend who is nearing retirement age. He will find many useful suggestions in it, and a warm, friendly introduction to the problems that will confront him.

Those problems are in part psychological, sometimes growing out of a decrease in one's sense of importance in the community. They are in part financial due to a reduced income and to inflation. In some respects they relate to one's state of health. But they all lend themselves to a solution if faced and planned for early enough.

It is evident as one reads this book that the author, the former director of a large retirement fund, is writing out of his own rich experience—this is no theoretical or sociological approach to the problems. In fact the author approaches his task with humor and a twinkle in his eye. He has a philosophy of life that will cheer the person of middle age.

The titles of some of the chapters indicate their practical nature, How It Feels To Retire, Making the Dollars Go Further, What Is Your Hobby, Getting Along with Folks, and What About the Wife? Some men will find particularly helpful the chapters entitled Retired and Living Alone and To Remarry or Not?

For those who wish to pursue special subjects in this field more intensively the author supplies a very good bibliography of some forty books relating to Old Age, Adult Interest, Hobbies, Social Security, and Annuities.

In view of the prediction that by 1975 we shall have 17 million people over 65 years of age in the United States, the necessity for a good understanding of

what is ahead of them is apparent. Many of these people need a wholesome introduction such as this book offers to the "Golden Age" that lies ahead of them. HOMER WICKENDEN

Understanding Your Son's Adolescence—*By J. Roswell Gallagher. Boston: Little Brown,* 1951. 212 pp. Price, $3.00.

To read this book is almost to have an interesting, informal conversation with a man who understands boys and has a lot of common sense as well as professional skill and long experience in dealing with them. The author's background includes service as school physician in Hill School and Phillips Academy.

His viewpoint is that during the adolescent years a boy "needs guidance rather than protection, subtle suggestion and good example instead of commands, and infinite patience with the errors he is bound to make on his way to maturity." He needs also "love, security, a chance to develop his own personality and become independent. and help in learning how to live with and respect others."

With this philosophy Dr. Gallagher discusses simply and illustrates with thumbnail case histories many matters ranging from allowances, daydreaming, and fraternities, through "natural rhythm of the bowels," acne, and choice of vocation, to stealing and suicide. One could wish that he had dealt with sex more fully because of the soundness of what he does choose to say. The chapter on health facts should be a very practical guide to parents in many matters which should be discussed with the family physician. Throughout is a sound emphasis on the normal variations among adolescents.

The volume does not pretend to cover all adolescent behavior. It can be heartily commended to parents for its breadth of view, sound interpretations, and reassuring confidence in the ability of a boy, with understanding and help from parents and others, "to make a sound transition from childhood to adulthood." ROY E. DICKERSON

Introduction to Statistical Analysis—*By Wilfrid J. Dixon and Frank J. Massey, Jr. New York: McGraw-Hill,* 1951. 370 pp. Price, $4.50.

This book should prove of value to both the professional statistician in public health work and to the general public health worker. The former will find a helpful presentation of the concepts upon which many of the modern developments in statistical analysis are based; the latter will heighten his understanding of the logical principles of statistical inference.

The first nine chapters cover the usual topics to be found in introductory texts on statistics. It is the approach rather than the subject matter of these chapters which is unusual. The book begins with a brief but good discussion of the nature of proof and quickly introduces the concepts of distribution, sample, and population. The fourth chapter, on "Universe and Sample," presents the experimental approach to the idea of sampling variation by taking repeated samples under the same conditions and forming the sampling distributions of the mean and variance. Chapter 6 is concerned with confidence intervals and expresses the idea as an algebraic inequality. It is important for the reader to fix the meaning of such algebraic expressions clearly in his mind, since they occur throughout the remainder of the book. Perhaps an attempt in the next edition at diagrammatic portrayal of the idea of confidence intervals would be helpful.

The next chapter is concerned with statistical inference and sets the pattern for the remainder of the book. The authors discuss the general principles of testing hypotheses and the two types of

error which can be committed when making a decision concerning an hypothesis: (1) that of rejecting the hypothesis when it is true, and (2) that of accepting it when it is false. By specifying in advance the probability of making the first type of error, the values of the particular statistic being examined which will result in rejection of the hypothesis may be determined. The statistic is then computed from the observed data and compared with the critical values obtained in the previous step, and the hypothesis accepted or rejected in accordance with the previously stated criteria.

This process of formulating and testing hypotheses is carefully set forth in relation to each new topic which is introduced. The authors have succeeded by this means in providing the reader with a logical thread which ties together such varied subjects as analysis of variance, regression and correlation, nonparametric statistics, and sequential analysis. In the presentation of these subjects the authors have been at some pains to state explicitly the assumptions involved in a particular procedure for testing an hypothesis, and the consequences of not satisfying these assumptions are demonstrated. A separate chapter is devoted to a consideration of the probability of accepting a false hypothesis—the second type of error mentioned above—and the development of power functions for tests of hypotheses is clearly set forth both algebraically and diagrammatically. An excellent feature of the book is the inclusion in the appendix of practically all the tables needed to determine critical values in the sampling distributions of the various statistics discussed in the text.

Readers of the *Journal* will gather from the foregoing that this book is primarily concerned with that phase of statistical analysis which is concerned with "significance testing." The authors have done an excellent job of presenting the logical framework upon which this aspect of statistical analysis is based. However, that aspect of statistics which is concerned with the formulation of the problem is only touched upon here and there. This is unfortunate because it is an understanding of this aspect of statistics which is most sorely needed by the public health worker, including the public health statistician.

Dealing as often as he does with enumeration statistics, the public health worker may find the chapter on this subject somewhat disappointing, particularly the discussion of the point binomial and its relation to the Poisson distribution. An example of the latter would perhaps be more helpful than the discussion of binomial-probability paper. Part of the chapter entitled "Macrostatistics" contains a section on the function of the different kinds of punch card equipment, but this reviewer feels that a discussion of the problem of classification, which always arises in any punch card study and which is a fundamental scientific problem, would be more meaningful. These criticisms, however, are easily dealt with and they do not prevent the book as a whole from serving as an excellent introduction to statistical anaylsis in the sense described above. PAUL M. DENSEN

Clinical Tropical Medicine—*Edited by R. B. H. Gradwohl, Luis Benitez Soto, and Oscar Felsenfeld. St. Louis: Mosby,* 1951. 1647 pp., 473 illustrations, 7 color plates. Price, $22.50.

This tremendous volume contains contributions by 57 different authors. The editors have done a real service in bringing out a volume on tropical diseases with a Western Hemisphere slant. Most of the contributors are from the Americas, and some of them are outstanding investigators whose writings, for the most part, have not been available in English. There is good coverage of the diseases peculiar to the American

tropics—Chagas' disease, mucocutaneous leishmaniasis, pinta, and bartonellosis. Many of the other chapters are excellent. However, the book as a whole shows a great variation in quality.

Some of the chapters fail to present good clinical descriptions. In several chapters, the therapy is not sufficiently up to date for a book published in 1951. Notable omissions are chloroquine for hepatic amebiasis, the 8-aminoquinolines for prevention of relapses in malaria, atabrine for taenia infestation, and diasone (except for inadequate discussion in the general chapter on the therapeutics of tropical diseases), sulfamethetrone, and streptomycin for leprosy.

In any text on tropical diseases the chapters on malaria and amebiasis naturally come under close scrutiny. Amebiasis is, on the whole, well presented. There is some carelessness, however, in the discussion of therapy. It is incorrect to state that milibis is not effective or that chloromycetin is. It is likewise misleading to state that fulminating amebiasis should be treated with emetine, penicillin, and bacitracin, without mentioning drugs such as diodoquin or carbarsone.

The chapter on clinical malaria is very unsatisfactory. The space allotted to it is too small and the material is presented in an obscure, confusing, and sometimes contradictory fashion. There are some gross errors. For example, the colored plate depicting the cycles of the various plasmodia shows the sporozoite directly invading the erythrocytes and fails to show correctly the typical trophozoite forms of *Plasmodium malariae*. The discussion of treatment is totally inadequate.

As a whole, the book shows the lack of a firm editorial hand. Some portions are too discursive, others too terse to be adequate. At least three chapters are superfluous: that on malaria control (since this is a clinical text); that on hematology; and that on therapeutics of tropical diseases, which repeats much that is in other chapters and frequently fails to give useful details as to dosage and methods of administration, which the clinician wants

HOWARD B. SHOOKHOFF

Report of the Governor's Study Commission on the Deviated Criminal Sex Offender—*Lansing, Mich.: State Department of Health*, 1951. 245 pp.

This is a very substantial document reporting the conclusions of a 22 member commission appointed in November, 1949, to study the sex offender as a social problem and to make recommendations for more effectively meeting it. Other states and smaller communities coming to grips with such problems will do well to familiarize themselves with this systematic study of the subject.

The summary and recommendations of this report are condensed into 40 paragraphs containing much practical experience and evidence of sound planning. Most of these conclusions are as applicable elsewhere as in Michigan.

The body of the report is made up of five chapters on fact finding, resources and present practices, legislation, education, and moral and spiritual values. There is a selected bibliography and an appendix.

This is a highly recommended volume.

REGINALD M. ATWATER

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Causes Are Considered—"Practically three years has been added to (the) expectation of life since the close of World War II. . . ." So, it seems, the phenomenal 11 year increase in the span of life that has occurred in each 20 year period of the recent past promises to continue a while—though obviously such a rate cannot go on much longer.

ANON. Health Progress 1946 to 1950. *Statist. Bull. Metrop. Life Insur. Co.* 32, 9:3 (Sept.), 1951.

From the Misty Past—Do you remember the by now two-year-old editorial entitled, "The New Look in Health Department Reports"? You'll agree that it might as well have been named "The Old Look" if you will read a recent tribute to John Simon, whose annual reports—a full century ago—clearly pointed the way for the then emerging sanitary sciences. One report, published verbatim in nine columns of the (London) *Times*, was judged editorially "unquestionably the ablest, the most lucid and most temperate statement of our sanitary conditions and wants that it has been our fortune to peruse."

CHARLES, J. Presidential Address on John Simon and Some Contemporaries—A Brief Retrospect. *J. Roy. San. Inst.* 71, 4:286 (July), 1951.

Yes, You Will Be!—"The reader may be surprised in going over the above list to observe that virtually every letter of the alphabet has been used to describe various nutrilites." New vitamins will continue to crop up over the scientific horizon and, in the future, the writer prophesies they will all be given descriptive chemical names (and the alphabet can return to its regular job).

CHELDON, V. H. Nomenclature of Vitamins. *Nutrition Rev.* 9, 10:289 (Oct.), 1951.

It's Inducive to Mental Peace, He Says—Our own recruitment and training pathfinders will be interested in this attempt of one British M.O.H. to "sell" public health as a career to prospective medical candidates. His underselling will bring tears to the eyes of any proper (American) public relations counselor.

CLARK, W. G. The Public Health Service As a Career. *M. Officer* 86, 12:113 (Sept. 22), 1951.

V I D (Very Important Document)—"This particular study sets up curves to indicate ages most affected by any specific disease with enough cases reported in the survey to give reasonably accurate results." This single quote describes the whole paper so well that it would seem to be a lily-painting superfluity to attempt to add to it.

COLLINS, S. D., *et al.* Age Incidence of Specific Causes of Illness Found in Monthly Canvasses of Families. *Pub. Health Rep.* 66, 39:1227 (Sept. 28), 1951.

Bless Their Little Hearts!—Here is solid statistical support for what almost every parent must have learned from hard experience. Young children (under age nine) not only have more respiratory illnesses than older ones, but they are also much more likely to pass their colds, etc., on to their parents.

COULTER, J. E., and TUCHER, D. The Risk of Attack of Respiratory Illness Among Parents of Children of Various Ages. *Milbank Mem. Fund Quart.* 29, 4:423 (Oct.), 1951.

Double-Barreled Item—Five leading questions about water fluoridation, asked by the A.W.W.A., received complete, unequivocal and convincing answers. In prescribed amounts fluorine is not toxic; water fluoridation is not mass medication; comparable municipal cancer rates reveal no relationship be-

tween malignancy and fluoridation; the process received unqualified USPHS endorsement.

DEAN, H. T. USPHS Position on Fluoridation of Public Water Supplies. *J.A.W.W.A.* 43, 9:672 (Sept.), 1951.

A brief but broad and convincing review of what most of us now know about the beneficent results accumulating from fluoridating water supplies (at present under way in 63 communities in 15 different states).

DEAN, H. T. The Partial Control of Dental Caries by Fluoridation of Public Water Supplies. *J. Missouri Dent. A.* 31, 8 (Aug.), 1951.

Meaningful Data—Most of us, I suspect, accept the findings of chronic morbidity surveys without giving much thought to the ways the statistics were collected. Some of the difficulties in long-term studies are discussed in this enlightening paper and you really should know about them.

DOWNES, J. Method of Statistical Analysis of Chronic Disease in a Longitudinal Study of Illness. *Milbank Mem. Fund Quart.* 29, 4:404 (Oct.), 1951.

How To Feed Fluorine—If you want to be informed about the mechanics of feeding fluorine into municipal water supplies you will find all you could conceivably need to know in this detailed, technical, 18 page discussion.

HARPER, L. E. Fluoride Chemical Feeding. *J.A.W.W.A.* 43, 9:744 (Sept.), 1951.

Feather in M C H's Cap—"The so-called degenerative conditions—cardiovascular disease and cancer—now cause more deaths among children of school age in the United States than all the infections and parasitic diseases combined." Statistical substantiation follows this quoted introduction.

KAHN, H. A. Changing Causes of Death in Childhood. *Pub. Health Rep.* 66, 39:1246 (Sept. 28), 1951.

Good Reporting—This is a blow-by-blow account of the first three rounds of a community fight against heart disease. Incidentally it is an excellent demonstration of how interesting and readable a straightforward, unglamorized story can be when it is about people really in action. Why, oh why, can't we have more?

KATTWINKLE, E. E., *et al.* A Community Heart Program. *New England J. Med.* 245, 16:595 (Oct. 18), 1951.

Unfinished Business—Don't deprive yourself of the enjoyment of this treat which, the author says, should have been called, "Courting Frustration in a Nosological Jungle." There is "something old and something new" in it, but chiefly it is the way the combination is presented that will delight you.

LANGMUIR, A. D. The Importance of the Respiratory Diseases. *Am. Rev. Tuberc.* 64, 4:461 (Oct.), 1951.

Statistical Sins We Commit—You need greatly to read this, not only for the wisdom in it, but because it is so humanly presented. The writer seems capable of thinking, every moment, of his readers—a rare faculty indeed. The title tells enough of what the paper is about.

LEWIS-FANING, E. Survey and Sample: Statistical Pitfalls. *Pub. Health* 64, 12:225 (Sept.), 1951.

Prophylactic Artillery—This round table discussion of ten immunization procedures is recommended to all who have anything whatever to do with child health, however remote the connection. Those actively on the communicable disease firing line will surely know all about the review.

MCGUINNESS, A. C., *et al.* Immunization Review. *Pediatrics* 8, 4:558 (Oct.), 1951.

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ACCOUSTICAL TERMINOLOGY. New York: American Standards Association, 1951. 50 pp. Price, $1.50.

APPROVED LABORATORY TECHNIC. John A. Kolmer, Earle H. Spaulding, and Howard W. Robinson. (5th ed.) New York: Appleton-Century-Crofts, 1951. 1180 pp. Price, $12.00.

ATLAS OF FRAMBOESIA. Kenneth R. Hill, R. Kodijat and M. Sardadi. World Health Organization Monograph Series No. 5. New York: Columbia University Press, 1951. 18 pp. 42 illus. Price, $1.00.

CONAEMIE THERAPY. Masao Yamagata. Sibaura, Minato-ku, Tokyo, Japan: Herald Press, 1951. 180 pp.

FACTS FOR YOU. A STUDY ON ANNUAL REPORTS. Herbert L. Fisher. Tampa, Fla.: Y. M. C. A., P. O. Box 1259, 1951. 11 pp. Price, $1.00.

FACTS OF LIFE FROM BIRTH TO DEATH. Louis Dublin. New York: Macmillan, 1951. 461 pp. Price, $4.95.

FIGHT AGAINST FEARS. Lucy Freeman. New York: Crown Publishers, 1951. 332 pp. Price, $3.00.

GLOBAL EPIDEMIOLOGY. A GEOGRAPHY OF DISEASE AND SANITATION. Vol. II. Africa. James Stevens Simmons, Tom F. Whayne, *et al.* Philadelphia: Lippincott, 1951. 652 pp. Price, $15.00.

HEALTH IN SCHOOLS. American Association of School Administrators (rev.). Washington, D. C.: Department of the National Education Association of the United States, 1951. 477 pp. Price, $4.00.

HOW TO SLEEP WITHOUT PILLS. David F. Tracy. New York: Sterling Publishing, 1951. 62 pp. Price, $1.00.

IMMUNIZATION AND THERAPEUTIC PROCEDURES FOR ACUTE INFECTIOUS DISEASES OF THE AMERICAN ACADEMY OF PEDIATRICS, REPORT OF THE COMMITTEE ON. John J. Miller, Jr., Chairman. Evanston, Ill.: American Academy of Pediatrics, 1951. 69 pp. Price, $.25.

INFANT CARE. Children's Bureau Publication No. 8. (9th ed.) Washington: Govt. Ptg. Office, 1951. 145 pp. Price, $.20.

INSTITUTE OF FAMILY AND COMMUNITY HEALTH. Report of the Medical Officer-in-Charge, 1950. Union of South Africa: Department of Health. 42 pp.

JOHN J. SIPPY, THE LIFE AND WORKS OF. Lecture Presented at the Annual Meeting of the Western Branch, A.P.H.A., Portland, Oregon, May 31, 1950. W. P. Shepard. San Francisco Western Branch, A.P.H.A., 1951. 22 pp.

JOURNEY TOGETHER. THE WAY BACK TO HAPPINESS. Turnley Walker. New York: David McKay, 1951. 144 pp. Price, $2.50.

MEDICAL TERMINOLOGY MADE EASY. JeHarned. Chicago: Physicians' Record, 1951. 275 pp. Price, $5.00.

MILITARY STANDARD MARKING OF SHIPMENTS. Department of Defense. Washington: Govt. Ptg. Office, 1951. 51 pp. Price, $.35.

MOLDS AND MAN. Clyde M. Christensen. Minneapolis, Minn.: University of Minnesota Press, 1951. 244 pp. Price, $4.00.

MONEY MANAGEMENT—YOUR HEALTH DOLLAR. Chicago: Household Finance Corp., 1951. 30 pp. $.05 ea.

ON BEING INTELLIGENT. Ashley Montagu. New York: Henry Schuman, 1951. 236 pp. Price, $2.95.

PHASE MICROSCOPY. PRINCIPLES AND APPLICATIONS. Alva Bennett, Harold Osterberg, *et al.* New York: John Wiley, 1951. 320 pp. Price, $7.50.

PHYSIOLOGY OF WORK AND PLAY. A TEXTBOOK IN MUSCULAR ACTIVITY. Sarah R. Riedman. New York: Dryden Press, 1950. 584 pp. Price, $4.90.

PREVENTION OF WHOOPING-COUGH BY VACCINATION. Reprint from the British Medical Journal, Vol. 1, June 30, 1950. London: British Medical Association. 10 pp.

REHABILITATION NEEDS OF PATIENTS IN PUBLIC TUBERCULOSIS HOSPITALS IN UPSTATE NEW YORK, REPORT OF THE COMMITTEE ON. Albany, N. Y.: State Department of Health, 1951. 28 pp.

ROSENAU'S PREVENTIVE MEDICINE AND HYGIENE. Kenneth F. Maxcy (7th ed.). New York: Appleton-Century-Crofts, 1951. 1462 pp. Price, $14.00.

TENNESSEE REGIONAL INDUSTRIAL HEALTH CONFERENCE, DEC. 7–8, 1950. Nashville, Tenn.: Industrial Hygiene Service, State Department of Health. 55 pp.

TEXAS NURSES IN REVIEW. A SURVEY OF NURSING SOURCES AND RESOURCES IN THE STATE OF TEXAS. Houston, Tex.: Foundation for Research and Development in Health Activities, Suite 209, Hermann Professional Building, 1951. 92 pp.

YOUR DIABETES. A MANUAL FOR THE PATIENT. Herbert Pollack and Mary V. Krause. New York: Paul B. Hoeber, 1951. 212 pp. Price, $3.00.

Motion Picture Film Reviews

HOMER N. CALVER, *Film Review Editor*

Investment in Human Welfare. Promotes public understanding of the problems and achievements of the handicapped. 16 mm. Color. Sound. About 22 minutes. Produced for the State of West Virginia by Unifilms, Inc. A national version, sponsored by the Federal Security Agency, Office of Vocational Rehabilitation, Washington 25, D. C., can be obtained from that office for free loan. Prints for purchase at $150.

Unlike many rehabilitation films, "Investment in Human Welfare" succeeds in its objective of creating a better understanding of vocational rehabilitation. It gives a well-rounded demonstration of the ability of the handicapped to compete in a normal working environment when properly guided and placed. Dramatization of this sort is a natural medium for presenting the emotional subtleties of patients' problems, but the rehabilitation and employment process itself appears too complex for full demonstration through a single educational film.

Frequently, films overemphasize one handicap, one occupation, or one part of rehabilitation, leaving the onlooker with a limited idea of what the rehabilitation process means. The present film overcomes this problem, at least in part, by depicting many types of the handicapped on actual jobs in normal work situations. No disability is overemphasized. On the contrary, those disabilities not usually portrayed, such as the cardiac, tuberculous, epileptic, and congenital deformity, are shown along with the orthopedic and others.

Nor is one area of occupations given too much footage. By depicting the handicapped on jobs from farm hand to top executive, the film succeeds in erasing the misconception that only circumscribed occupations are suitable for the disabled. Note is made of the fact that handicaps sometimes work to the advantage of the individual when he is properly placed.

The rehabilitation process itself is interwoven through the story of one disabled individual, but is confined to post-hospital rehabilitation. One wishes that a film so well constructed could tell the whole story, but again the complexities of the problem are limited by the medium.

Narrated by John Erickson, MGM star, with appropriate background music and scenic color, the film has the popular touch. It would stimulate any adult group and would be of especial value where employers compose a fair percentage of the audience.

HELEN K. VASSARDAKIS

See Better: Healthy Eyes. 16 mm. Available in color or black and white. Sound. 10 minutes. Produced by Coronet Films, 65 E. South Water St., Chicago 1, Ill. Color prints about $90; black and white about $45. Consult film rental libraries for loan charges.

The brief explanation in this film of the structure and function of the eye is appropriate for sixth, seventh, and eighth grade school children. The film is made interesting by showing examples of boys and girls with various common eye conditions. There follows some advice about taking care of the eyes through maintenance of good health (eating the right foods, getting the necessary amount of sleep, and cleanliness), following safety rules, and using the eyes properly. There is a good discussion of what the child should do if he has a foreign body in the eye.

A portion of the film that should be of particular interest shows some of the

tests that are made as part of an eye examination by an oculist or optometrist, and the difference between these two professions is explained, as well as the part the optician plays in providing good eye care. This film should be useful as a supplement to regular classroom instruction about eye care in the grades for which it is intended.

FRANKLIN M. FOOTE

Your Birth Certificate. Why birth registration is necessary, for the individual and for statistical purposes. 16 mm. Color. With sound. 15 minutes. Produced by the Texas State Department of Health, Austin, Tex. Distributed by Jamieson Film Company, 3825 Bryan St., Dallas, Tex. Write them for purchase price of prints. Free loan in Texas; consult film rental libraries elsewhere. Released for television. Audience leaflet from Texas State Health Department.

To quote the good phrase recently coined by a state registrar, a birth certificate is a deed to citizenship. In this film the Texas State Department of Health explains, in terms suitable for general audiences, why everyone needs a correct birth certificate and how it serves him in a variety of ways throughout his life.

The picture begins attractively, with a prospective father and mother choosing a name—and showing the good sense to pick two, in case it's a girl. After the baby is born (it happens to be twins), the camera moves rapidly over typical situations in which the birth certificate may be needed—to enter school, get certain types of jobs, obtain a driver's or pilot's license, vote, obtain a passport, marry, run for public office, enter certain professions, inherit property, and qualify for various retirement and pension benefits. The personal case for filing a birth certificate is an impressive one, and the film makes the most of it.

Public health workers, of course, are interested in the derived statistics as well as in the individual birth records, since the statistics serve as a base for planning and evaluating infant, child, and maternal health programs, for medical research, and for various economic and social programs. Because such statistics are only as good as the underlying individual records, every health department should do what it can to promote complete birth registration.

This film, the first on this subject for general distribution, should prove an effective tool.

HALBERT L. DUNN

Projecting Motion Pictures. Tips for amateurs by professionals. 16 mm. Black and white. Sound. 10 minutes. Produced by the Motion Picture Division, University of California, Los Angeles 24, Calif. Purchase price $45, with 10 per cent discount to educational institutions; for rent from the University at $2.

This film offers a good orientation to the problems of projection.

After establishing the importance of good projection and the fact that audiences demand a smooth-running show, the film takes the viewer through all the steps of projection. Step by step, it shows the projectionist setting up his equipment, testing and checking his setup, and exhibiting the film to an audience.

It deals with such problems as the best placement of chairs, proper room darkening, distractions, placement of cables, loud-speakers, the proper way to start a projector, and how to prevent "off-focus" starts. It goes into more detail on keeping watch over the projector during the show and shows some of the common mishaps which can occur. The film assumes that the more simple techniques of operating a projector (such as threading, operating controls, etc.) are already known.

While the film is specific in the step by step treatment, it is purposely lacking in the detail of many of these steps to induce the viewers to discover on their own the answer to such variables as the distance from projector to screen and

what size lens to use, the placement of seats for the best angle of viewing, etc.

The narration is well paced and easily understood. Technically, it is a smooth production with good transitions and some commendable imagination in the choice of camera angles and pictorial composition. WILLIAM J. GANZ

Multiple Screening. 16 mm. Black and white. Sound. 9 minutes. Produced for the Department of Health, Commonwealth of Pennsylvania, by Communications Materials Center, 413 W. 117th St., New York 27, N. Y., in association with Tempo Productions. Prints available at $35 each; rental $2.50.

The objective of the film is to present multiple screening to doctors, public health workers, and community leaders. It is an animated documentary film which explains primarily the problem and detection of chronic diseases, with the aid of cartoons, flow charts, and some live action shots.

The story begins with Mr. and Mrs. Smith riding in a carriage some fifty years ago and facing a shorter span of life due to the hazards of smallpox, diphtheria, and typhoid. Mr. and Mrs. Smith of today are older, riding in the latest model automobile, and are presented as in fairly good shape but with bulging waistlines, high blood pressure and problems of heart, and kidney disease. The film presents the problem of detecting the presence of chronic illness in apparently well persons, not in individual screening programs but as a multiple screening program held in a health center.

This program must be economical, fairly specific, easy to administer, and approved by the medical society. Multiple screening is a community project. Individual tests are tailor-made to fit each community's needs, and each test is depicted as lasting 3 minutes. The personnel of the clinic consists of receptionist, technicians, clerks, and a supervisor. Several hundred persons may be screened in a day. The film depicts Mr. Smith going through the various test procedures and at the end of the session Mr. Smith is reminded that a report of positive findings will be sent to his private physician for interpretation, diagnosis, and treatment.

The private practitioner is presented as in a dilemma, knowing that there are many cases of glaucoma, high blood pressure, heart disease, cancer and other chronic illness, but since he cannot advertise, he has no way of finding these cases in early stages and thereby offering them the best treatment. Multiple screening is presented as a means of combating the rise of chronic diseases in protecting the health of the people while they still have it.

The dialogue of the film, by a male voice, is excellent and well modulated. Some of the action shots of the clinic are less well lighted than the studio-produced portion of the film. On the whole the film is of excellent quality, informative, and suitable for both physicians and the public. The film was well received by both professional and lay viewers. It offers a vivid presentation which can be utilized by health department personnel in presenting the subject of multiple screening to medical societies and civic leaders. It is a film which could well be purchased by every health department desirous of promoting multiple screening.

VLADO A. GETTING

Top Row. From left—Frederic A. Gibbs, M.D., Illinois Neuropsychiatric Institute, University of Illinois College of Medicine; William Gordon Lennox, M.D., The Children's Medical Center, Boston; David M. Heyman, Chairman of the Board, Health Insurance Plan of Greater New York; Ernest L. Stebbins, M.D., Chairman, A.P.H.A. Lasker Awards Committee; Karl F. Meyer, M.D., Director, The George Williams Hooper Foundation, University of California; George Baehr, M.D., Medical Director, Health Insurance Plan of Greater New York; Mr. Bernard Smith, Chairman of the Board, Alcoholic Foundation, New York; Bottom Row. From left—Mrs. Albert D. Lasker, of the Lasker Foundation; Florence R. Sabin, M.D., Denver; Elise L'Esperance, M.D., of the Sloan-Kettering Institute for Cancer Research, Memorial Hospital, New York; and Catharine Macfarlane, M.D., Woman's Medical College, Philadelphia.

THE LASKER AWARDS FOR 1951

1951 marks the sixth annual presentation of Lasker Awards by the American Public Health Association. The Lasker Awards are provided by the Albert and Mary Lasker Foundation to individuals and groups for outstanding contributions in research related to diseases which are the main causes of death and disability, and for distinguished service in the field of public health administration.

The awards were conceived not only to honor the recipients and dramatize their accomplishments, but also to arouse increased professional and public interest in medical research and public health administration and to aid in the rapid dissemination of vital new health information to the peoples of the earth.

In the five years since their establishment, the Lasker Awards have come to be regarded among the nation's primary medical honors.

The following citations were presented to the recipients at the First General Session of the Association's Annual Meeting at San Francisco on October 31, 1951. Each recipient received a statuette of the Winged Victory, together with a beautiful leather-bound and illuminated citation. Individual winners received checks for $1,000, which were equally divided between joint recipients.

E. L. Stebbins, M.D., was Chairman of the Award Committee. The citations were presented by Hugh R. Leavell, M.D., Chairman of the A.P.H.A. Executive Board, as follows:

FLORENCE R. SABIN, M.D., has the distinction of having crowded three distinguished careers into one lifetime. First, her career as Professor of Histology at Johns Hopkins; second, the significant research she carried on at the Rockefeller Institute, particularly in cytology, which led to important discoveries as to cellular responses; third, and for which we honor her today, the field of public health administration. Upon retirement from her earlier careers, she returned to her native State of Colorado, where she was shocked by the failure to apply knowledge developed in the research laboratories to the prevention of disease and disability.

In 1945 she was appointed Chairman of the Health Subcommittee of the Governor of Colorado's Post-War Planning Committee. This marked the birth of a whirlwind. She soon obtained funds for a thoroughgoing study of health conditions in the State of Colorado. She organized a planning committee which worked diligently with her drafting a modern program of public health for the state, and the legislation to implement this plan. But recognizing the necessity for public support if such legislation were to be put into effect, from her "retirement" she undertook the almost superhuman task of covering the state, explaining the importance and the urgency of health legislation. Of nine pieces of legislation which the plans required for implementation, all but one became law—an unprecedented legislative accomplishment. After several years of intensive activity and with the accomplishment of her major purpose, she was still unwilling to subside. With the election of a progressive government in the City of Denver, she again saw the possibility of further improving health conditions for the citizens of her home territory. She again accepted the challenge and became Director of Health and Charities of the City of Denver. Here again she gave unselfishly of her time and energy for the improvement of the public health, and through the force of her enthusiasm and personality attracted a competent professional staff that has completely reorganized and developed the health services of that city.

In recognition of these outstanding achievements in the field of public health administration, the American Public Health Association presents to Dr. Florence Sabin a Lasker Award for 1951.

ELISE L'ESPERANCE, M.D., and CATHARINE MACFARLANE, M.D., are the discerning leaders who envisioned the control of cancer by regular physical examinations of presumably healthy people for the detection of early cancer or precancerous lesions.

Dr. L'Esperance, convinced of the importance of preventive methods to cancer control, established the original Strang Clinic in 1937. Through her persistent and sustained efforts, her clinics today offer service, training for young physicians, and research to facilitate prevention and early diagnosis. They are the proving grounds for new procedures. Moreover, her principle of mass-scale health screening and education of well people has reached out to discover early manifestations of other diseases, and has entered the curriculum of medical schools for the doctors of tomorrow.

In the year following the establishment of Dr. L'Esperance's first clinic, Dr. Macfarlane undertook a similar program. She organized the first cancer prevention clinic in Pennsylvania to determine, in presumably well women volunteers, the value of periodic partial examinations in detecting cancer of the breast and uterus in an early and curable stage and in detecting lesions which may predispose to cancer.

Today in the United States, 251 cancer detection clinics patterned after these pilot establishments attest to the vision, energy and accomplishment of the two pioneers who are here honored. For outstanding administrative achievement in the field of preventive medicine the American Public Health Association salutes Dr. Elise L'Esperance and Dr. Catharine Macfarlane through this joint Lasker Award.

KARL F. MEYER, M.D., brilliant scientist, dynamic teacher, inspired humanitarian. His influence now extends over two generations of students of medicine, biology, and the allied sciences. His research and leadership have benefited all classes of people for four decades. His ubiquitous interest in the parasitic enemies of man and animal has led him to many parts of the world, opening to him the laboratories and scientific literature of many lands, bringing him, and us, new knowledge of the ecology, chemistry, physiology, and pathology of both host and parasite.

Among his accomplishments is a major share of responsibility for the control of botulism, and for a classification and international identification center for the clostridia; for our recognition that plague is sylvatic, not merely rat-borne; for understanding of the broad spectrum of brucellosis rather than restricted goat-borne Malta fever; for the concept of ornithosis rather than psittacosis; for elucidating the role of the arthropod vector

in western equine encephalomyelitis; for showing that western ticks are also responsible for relapsing fever; for studying the dinoflagellate causing mussel poisoning; for increasing our knowledge of leptospirosis; for valuable assistance with investigations of Q fever.

No ivory tower recluse, Karl Meyer has responded promptly and gratis to calls for help from physicians, scientists, health officers, farmers, fishermen, canners, the Military, and the United States Government. Inherent in his research is its application. To both he has applied himself with boundless energy and humanitarian generosity, to the great good of mankind. The American Public Health Association honors itself in honoring Dr. Meyer with a Lasker Award.

WILLIAM GORDON LENNOX, M.D., and FREDERIC ANDREWS GIBBS, M.D. These two investigators brought to the study of epilepsy an enthusiasm and sustained ability to put through a planned program of original research which has seldom been equaled in the study of a disease. Their work has opened a new era in the understanding of epilepsy.

Dr. Lennox did ten years of ground work in the clinical, metabolic, pharmacological and social aspects of epilepsy before the introduction of the electro-encephalograph brought to his hands in 1933 a new instrument for specific study of the dysrhythmias of the brain. His writings have refined the diagnosis and improved the treatment of epilepsy; they have made it understandable to physicians and laymen.

Dr. Gibbs joined Dr. Lennox in research on the cerebral circulation in 1932. He was quick to grasp the import of the electro-encephalograph. He mastered the new technique, improved it and applied it energetically. His originality and purposeful drive complemented Dr. Lennox's broad training and medical wisdom. Together they elucidated the pharmacology and genetics of seizures. In his own laboratory Dr. Gibbs has contributed greatly, especially to knowledge of the relation of sleep and the temporal lobe to epilepsy.

Their devoted labors have saved a host of sufferers from misery.

The American Public Health Association recognizes their outstanding achievement through a joint Lasker Award.

ALCOHOLICS ANONYMOUS. The American Public Health Association presents a Lasker Group Award for 1951 to Alcoholics Anonymous in recognition of its unique and highly successful approach to that age-old public health and social problem, alcoholism.

Since its founding 16 years ago, Alcoholics Anonymous has brought recovery to more than 120,000 chronic drinkers formerly thought hopeless. Today this world fellowship of 4,000 groups, resident in 38 countries, is rehabilitating 25,000 additional persons yearly. In emphasizing alcoholism as an illness, the social stigma associated with this condition is being blotted out.

Alcoholics Anonymous works upon the novel principle that a recovered alcoholic can reach and treat a fellow sufferer as no one else can. In so doing, the recovered alcoholic maintains his own sobriety; the man he treats soon becomes a physician to the next new applicant, thus creating an ever-expanding chain reaction of liberation, with patients welded together by bonds of common suffering, common understanding and stimulating action in a great cause.

This is not a reform movement, nor is it operated by professionals who are concerned with the problem. It is financed by voluntary contributions of its members, all of whom remain anonymous. There are no dues, no paid therapists, no paid professional workers.

Historians may one day recognize Alcoholics Anonymous to have been a great venture in social pioneering which forged a new instrument for social action; a new therapy based on the kinship of common suffering; one having vast potential for the myriad other ills of mankind.

HEALTH INSURANCE PLAN OF GREATER NEW YORK. It has become increasingly recognized that the benefits of modern medicine can be brought to the people most effectively through the pooling of health personnel and facilities in the group practice of medicine.

To an unusual degree the basic validity of this principle has been demonstrated by the Health Insurance Plan of Greater New York in its use of medical groups to provide comprehensive health care on a prepaid basis to more than a quarter of a million persons.

The Health Insurance Plan of Greater New York has established and maintained high standards for the participation of practitioners and has submitted the quality of its services to critical self-appraisal and evaluation. It has emphasized the key role in group medical practice of the general physician who, working in close association with specialists and technical personnel, can serve effectively as family physician concerned with all aspects of care

for the individual in health and in disease. Major attention has been given to the development of health education, public health nursing, health examinations and other methods designed to promote health and prevent illness.

The American Public Health Association is honored to present a Lasker Group Award to the Health Insurance Plan of Greater New York for its courageous pioneering. There is no doubt that these patterns of medical organization and practice have enormous significance for the health services of the future.

CLEVELAND IN 1952

The 80th Annual Meeting will take place in Cleveland, Ohio, October 20–24, 1952.

ASSOCIATION NEWS

OFFICERS, 1951–1952

President—Gaylord W. Anderson, M.D., Minneapolis, Minn.
President-Elect—Wilton L. Halverson, M.D., San Francisco, Calif.
Vice-Presidents:
Walter L. Bierring, M.D., Des Moines, Iowa
Mac H. McCrady, Montreal, Quebec
Hernan Romero, M.D., Santiago, Chile
Treasurer—Charles Glen King, Ph.D., New York, N. Y.
Chairman of Executive Board—Hugh R. Leavell, M.D., Boston, Mass.
Executive Secretary—Reginald M. Atwater, M.D., New York, N. Y.
New Members of Executive Board:
Herman E. Hilleboe, M.D., Albany, N. Y.
Roy J. Morton, Oak Ridge, Tenn.
Joseph W. Mountin, M.D., Washington, D. C.

Gaylord W. Anderson, M.D., President of the American Public Health Association

Gaylord W. Anderson, M.D., Dr.P.H., of Minneapolis, Minn., Mayo Professor and Director, School of Public Health, University of Minnesota, assumed the Presidency of the Association at the close of the 79th Annual Meeting in San Francisco, Calif., on November 2, having served as President-Elect since 1950.

Gaylord W. Anderson, M.D.

Dr. Anderson, who is a native of Minneapolis, was graduated from Dartmouth College, following which he was a student at the Sorbonne in Paris and the University of Zurich, as well as at the Harvard Graduate School. He received his M.D. from Harvard in 1928 and his Doctorate in Public Health from the same institution in 1942.

On completion of his internship in the Albany, N. Y., Hospital, Dr. Anderson's commitment to public health became manifest with his appointment as epidemiologist in the Division of Communicable Diseases in the Massachusetts Department of Public Health, following which he became Assistant Director and later Director of the Division, as well as Deputy Commissioner of Public Health from 1931 to 1937. During the same period he was an Assistant in Public Health Administration at the Harvard School of Public Health and Executive Secretary of the Massachusetts Legislative Commission to investigate public health laws and policies, 1935–1937.

In 1937, he became Professor and Head of the Department of Preventive Medicine and Public Health at the University of Minnesota. With the reorganization of the Department into a School of Public Health, Dr. Anderson was named as Director and appointed to the newly established Mayo professorship. From 1942 to 1945 he served with the Medical Corps of the U. S. Army as Director of the Division of Medical Intelligence, advancing to the rank of Colonel. He was decorated with the Legion of Merit.

Dr. Anderson became a member of the American Public Health Association in 1930 and a Fellow of the Epidemiology Section in 1934. He is also identified with the American Epidemiological Society (President, 1950–1951) and with the American Medical Association.

He is co-author of a volume *Communicable Disease Control* with Margaret G. Arnstein, and a co-author of Volumes I and II of *Global Epidemiology*, representing sustained studies begun in the Office of the Surgeon General, U. S. Army, and since continued in association with James Stevens Simmons, Tom F. Whayne, and H. H. Horack. He is the author of numerous articles published in professional journals in the fields of epidemiology and public health administration.

Dr. Anderson on two occasions has served as an Elective Councilor with the Association and has been Vice-Chairman and Chairman of the Epidemiology Section. He has served conspicuously as a member of the Committee on Professional Education, having special interest in the accreditation of schools of public health and in the development of field training areas.

Dr. Anderson has served as a special adviser to the World Health Organization on public health man power and on several occasions has visited Latin American countries as a representative of the United States concerned with medical and public health education and the training of graduate students.

Dr. Anderson is also President of the Association of Schools of Public Health and is well known as a consultant to universities on problems relating to professional education of persons in public health as well as a consultant to various agencies on problems of epidemiology.

RESOLUTIONS

The following Resolutions were unanimously adopted by the Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., October 31, 1951.

APPRECIATION TO EXHIBITORS

RESOLVED, that the American Public Health Association expresses its grateful appreciation to those who have presented at its Seventy-ninth Annual Meeting the excellent exhibits, both scientific and technical, which are of great interest and value to the public health profession and which contribute so materially to the success of the Meeting.

APPRECIATION TO THE PRESS, RADIO AND TELEVISION NETWORKS

RESOLVED, that the American Public Health Association acknowledges its indebtedness to the press, and radio and television networks, national, state, and local, for excellent service in carrying to the people of America the important events of the Seventy-ninth Annual Meeting.

APPRECIATION TO OFFICIALS AND GROUPS

RESOLVED, that the American Public Health Association expresses its grateful appreciation to the San Francisco Committee and the agencies represented thereon for their gracious hospitality, and be it further

RESOLVED, that the warm thanks of officers and members be extended to J. C. Geiger, M.D., Chairman of the San Francisco Committee, and his colleagues on the committee

for their many courtesies, generous contributions of time and energy, and their efficiency in making provisions for this meeting and in the conduct thereof.

THANKS TO THE HOTELS

RESOLVED, that the American Public Health Association expresses its appreciation to the Palace Hotel, the Hotel Whitcomb, the Fairmont Hotel, and all other San Francisco hotels that opened their doors to the Association, and for their valuable assistance in the conduct of the Seventy-ninth Annual Meeting.

THANKS FOR SPECIAL PRIVILEGES EXTENDED

Of unusual interest and value to the participants at this Seventy-ninth Annual Meeting have been the many opportunities to see at firsthand many of the scientific and industrial features of the San Francisco area.

RESOLVED, that the American Public Health Association expresses its sincere thanks to the agencies of San Francisco and the Bay Area, and to those industrial organizations that have made their services available for the special benefit of members.

IN MEMORIAM

RESOLVED, that it is with a sense of irreparable loss that the American Public Health Association records, since its last Annual Meeting, the death of 83 Fellows and members, whose names constitute a part of this resolution.

Deceased Members and Fellows of the American Public Health Association, November, 1950, to September, 1951, inclusive

NAME	MEMBER	FELLOW	
Addison D. Aldrich, M.D., Houghton, Mich.	1944		
Beatrice H. Allison, M.T., Lockport, N. Y.	1950		
Elin L. Anderson, M.A., Washington, D. C.	1945		
Dr. Juan B. Ascanio, Caracas, Venezula, S. A.	1930		
Eugene L. Bishop, M.D., Chattanooga, Tenn.	1921	1924	
Joseph Blickensderfer, M.D., New Philadelphia, Ohio	1926	1932	
B. S. Bookstaver, M.D., Teaneck, N. J.	1950		
Waldo M. Bowman, Toledo, Ohio	1915	1922	Charter
Andrew Carney, Westfield, N. J.	1938		
Alexander M. Carr, M.D., Lewisburg, W. Va.	1935	1949	
Harold T. Castberg, M.D., Chicago, Ill.	1942	1945	
William R. P. Clark, M.D., San Francisco, Calif.	1932		
John Collinson, M.D., Dr.P.H., Baltimore, Md.	1927	1929	
G. M. Cooper, M.D., LL.D., Raleigh, N. C.	1919	1949	
John C. Danahy, M.D., Cincinnati, Ohio	1947		
George L. Davis, Mineola, N. Y.	1950		
Christopher L. Devitt, Jersey City, N. J.	1919		
Cranford H. Douthirt, M.D., Santa Fe, N. M.	1936		
Joseph M. Dowis, M.D., Grapevine, Tex.	1940		
Thomas M. Dugan, McKeesport, Pa.	1932		
Martin Dupray, M.S., Hutchinson, Kans.	1917	1922	Charter
Karl C. Eberly, M.D., Fort Wayne, Ind.	1936		
J. W. Ellms, Cleveland, Ohio	1897	1922	Charter
Celia M. Ferguson, R.N., Columbus, Ohio	1947		
Carlos Diez Fernandez, M.D., Venezuela, S. A.	1948		
Fernando Figueredo, M.D., Valencia, Venezuela, S. A.	1924		
Helen Fisher, Portland, Ore.	1945		
Ruth Foster, M.D., New York, N. Y.	1949		
Harry B. Franchere, M.D., Albany, N. Y.	1935		
Lauro S. Garcia, M.D., Boston, Mass.	1951		
C. A. Greenleaf, M.D., Olean, N. Y.	1950		
Robert B. Griffin, M.D., Ripley, Tenn.	1940		
Germaine A. Guntzer, M.D., M.P.H., Honolulu, Hawaii	1940		
Percy R. Howe, D.D.S., Boston, Mass.	1929		
Katharine M. Howell, M.D., Chicago, Ill.	1933		
Harold O. Hunt, M.D., Falmouth, Mass.	1948		
Lawrence R. Jacobus, M.D., Oakland, Calif.	1940		

NAME	MEMBER	FELLOW	
Benjamin C. Keeping, M.D., D.P.H., Charlottetown, P.E.I.	1931		
George McL. Lawson, M.D., Dr.P.H., Charlottesville, Va.	1930	1939	
Leon S. Lippincott, M.D., Daytona Beach, Fla.	1914	1923	Charter
Joseph I. Linde, M.D., New Haven, Conn.	1935	1939	
Hazel L. Loveland, R.N., Topeka, Kans.	1938		
Ray R. Lowther, M.D., Denver, Colo.	1948		
Walter J. Maddock, Bismarck, N. D.	1950		
Hector C. McAllister, M.D., Fort Wayne, Ind.	1928		
F. D. McMahon, Phoenix, Ariz.	1950		
Florence Meredith, M.D., Watertown, Mass.	1921	1932	
Mrs. Marion K. Meter, New York, N. Y.	1944		
Theodore R. Meyer, M.D., Dr.P.H., Sag Harbor, L. I., N. Y.	1932	1940	
J. E. Offner, M.D., Fairmont, W. Va.	1945		
Josephine Osterhoudt, M.S., Chicago, Ill.	1949		
Calvin G. Page, M.D., Brookline, Mass.	1914	1922	Charter
William B. Palmer, Orange, N. J.	1916	1929	
John B. Pastore, M.D., New York, N. Y.	1946		
J. Armand Patenaude, D.P.H., M.D., Quebec, Canada	1931		
Manuel A. Perez, San Juan, Puerto Rico	1947		
Lewis Radcliffe, Sc.D., Washington, D. C.	1937	1940	
Lonsdale J. Roper, M.D., Richmond, Va.	1919	1922	Charter
Ida W. Rothschild, M.D., New York, N. Y.	1949		
Herbert F. Salmond, Westfield, Mass.	1910		
Carl A. Scherer, M.D., Marysville, Calif.	1933		
Walter W. Scofield, Trenton, N. J.	1938		
John D. B. Scott, Victoria, B. C., Canada	1939		
Mary M. Scott, R.N., Topeka, Kans.	1949		
Frederick Smith, M.B., Montreal, Que., Canada	1933		
Ray E. Smith, Indianapolis, Ind.	1947		
Hermann Sommer, Ph.D., San Francisco, Calif.	1943		
Malcolm H. Soule, Sc.D., Ann Arbor, Mich.	1930	1934	
G. H. de Paula Souza, M.D., Dr.P.H., Sao Paulo, Brazil, S.A.	1919	1944	
Frank S. Stafford, M.S., Washington, D. C.	1942		
L. Phelps Stanley, M.D., South Charleston, W. Va.	1947		
E. G. Stillman, M.D., Cornwall, N. Y.	1919	1923	Charter
George W. Stober, M.D., Cleveland, Ohio	1949		
John Sundwall, M.D., Ann Arbor, Mich.	1919	1923	Charter
Lewis K. Sweet, M.D., Washington, D. C.	1936		
S. C. Tatum, Center, Ala.	1936		
Mrs. Marietta B. Tawney, M.A., Urbana, Ill.	1942		
Paul A. Turner, M.D., Louisville, Ky.	1921	1922	Charter
Thomas F. Walker, M.D., Great Falls, Mont.	1944		
G. T. Wasson, M.D., Bucyrus, Ohio	1920		
Virginia R. Wing, Cleveland, Ohio	1926	1934	
John J. Wittmer, M.D., New York, N. Y.	1935	1943	
John A. Wolcott, Oil City, Pa.	1944		

THANKS FOR USE OF AUDITORIUMS

In a meeting as large as that of the Annual Meeting of the American Public Health Association, provision of adequate meeting places is a major problem. The Association notes with gratitude the special courtesies extended in making special meeting halls available for the use of the Association.

RESOLVED, that the American Public Health Association extends its heartfelt thanks to the Department of Public Health of the City and County of San Francisco for the use of the Public Health Auditorium, and to the City of San Francisco for the use of the Civic Center Auditorium.

EVALUATION OF SANITATION PROGRAMS

WHEREAS, difficulty has been experienced in evaluating certain sanitation programs because of the lack of suitable measures of accomplishment, and

WHEREAS, additional uniform standards would aid materially in the measurement of sanitation accomplishment, and

WHEREAS, many types of programs within the broad field of sanitation are being conducted without the benefit of nationally recommended standards, therefore be it

RESOLVED, that the Public Health Service, the National Sanitation Foundation, and other appropriate organizations be requested to expand their programs toward developing standards for the various phases of sanitation.

DEFINITION OF "NEONATAL"

WHEREAS, the period "under 28 days" is used by the U. S. National Office of Vital Statistics and by various foreign countries as the definition of the term "neonatal," and

WHEREAS, this period has also been used to define certain categories in the *International Statistical Classification of Diseases, Injuries and Causes of Death*, and is consistent with the age groupings provided for mortality tabulations in WHO Regulation No. 1, be it therefore

RESOLVED, that the American Public Health Association recommend that the term "neonatal" be defined as applying to the period of life following delivery of less than 28 completed days, and that the various agencies concerned be urged to adopt this definition as standard.

TRANSFER OF RESPONSIBILITIES FOR INDIAN AFFAIRS

WHEREAS, the Bureau of Indian Affairs is responsible for the operation of 62 hospitals in Continental United States and Alaska for the exclusive care of American Indians, and is obligated to staff these hospitals with physicians and nurses to provide adequate public health services, medical and hospital care for the protection and promotion of the health of Indians, and

WHEREAS, the low salaries paid physicians serving in Indian hospitals under Civil Service appointments, the isolation of Indian Service stations where consultant service is unavailable, the lack of postgraduate training to prepare physician employees for Specialty Boards and other factors have made it impossible for the Bureau of Indian Affairs to recruit professional personnel to staff adequately Indian hospitals at any time over a period of many years, and

WHEREAS, none of the 62 hospitals now operated by the Bureau of Indian Affairs is recognized by the American Medical Association for the training of internes or otherwise as teaching hospitals, and

WHEREAS, the lack of adequate medical care and public health and hospital facilities for the care of Indians is contributing to unusually high disease and death rates among the American Indians as a racial group, therefore be it

RESOLVED, that the American Public Health Association endorses and recommends the transfer, by legislative action, of all health activities of the Bureau of Indian Affairs to the Public Health Service, the public (field) health services to be made a responsibility of the respective states in which Indians reside, and the Bureau of Indian Affairs hospitals to be staffed and operated by the Public Health Service as Public Health Service Hospitals.

EVALUATION OF RURAL SCHOOL HEALTH SERVICE METHODOLOGY

WHEREAS, direct experimentation and research in urban school health services have resulted in fundamental reorientation of these services in many cities, and

WHEREAS, such experimentation and research have not been extended to rural areas, and

WHEREAS, extension of the implications of this research to rural areas has been based largely on assumption of comparability and applicability, therefore be it

RESOLVED, that the attention of the Joint Committee on School Health of the Public Health Service, Children's Bureau, and Office of Education be directed to this situation, and be it further

RESOLVED, that the Committee be asked to sponsor planned studies in the evaluation of methodology in rural school health service.

FINANCIAL SUPPORT OF PUBLIC HEALTH ACTIVITIES

WHEREAS, the demands for additional funds for defense mobilization have increased the difficulties of adequately financing public health activities, and

WHEREAS, present defense mobilization is imposing additional burdens upon public health agencies, and

WHEREAS, public health agencies are finding it increasingly difficult to continue even existing programs in view of increasing costs, and

WHEREAS, there has been a tendency for Congress, state legislatures, and other appropriating bodies to decrease the funds available for general and special public health programs, and

WHEREAS, the American Public Health Association supports the concept that the national interest requires adequate support of public health programs, now therefore be it

RESOLVED, that the American Public Health Association reaffirm its stand for continuing adequate financial support for public health programs, and be it further

RESOLVED, that Congress, state legislatures, and other official appropriating bodies in this time of emergency be requested to provide the funds necessary to maintain the public health services essential for the protection and well-being of the public.

RESEARCH IN HEALTH EDUCATION

WHEREAS, the greatest advances in public health work have been made in those fields where research has provided a basis for program planning, and

WHEREAS, research in the field of biological sciences has made notable advances possible in public health practice, and

WHEREAS, health education is based in part on the social sciences and methods of research have been developed in these sciences, and

WHEREAS, the American Public Health Association has given important and necessary support to programs of research in the biological sciences, now therefore be it

RESOLVED, that the American Public Health Association urges the Public Health Methods Study Section of the Public Health Service of the Federal Security Agency and such other agencies as may have an interest in this field to develop, promote and support programs of research in health education.

HEALTH DEMONSTRATIONS FOR FOREIGN VISITORS

WHEREAS, there are now well established programs for bringing visitors from abroad to observe public health practices in our country, and

WHEREAS, the staffs of many of our state and local health departments who are called upon to demonstrate services are desirous of conducting this program in the most intelligent and effective manner possible, and

WHEREAS, it is believed that these efforts might be vastly more effective if the departments were better informed on the public health needs, the practices, and the available facilities in the home countries of our visitors, therefore be it

RESOLVED, that the sponsoring agencies of the public health visitation programs be urged to give specific study to present demonstration methods and programs and advise the participating departments on the most effective practices.

CONTINUING DEVELOPMENT OF FULL-TIME PUBLIC HEALTH SERVICES IN LOCAL AREAS

WHEREAS, there are still substantial areas of the United States, occupied by some 40 millions of people, which are without the protection of full-time local health services, and

WHEREAS, the continuing lack of such protective services constitutes a hazard to the residents of these areas and the traveling public, and

WHEREAS, the activities of many organizations under the leadership of the National Health Council have made the advantages of full-time public health services widely known, and

WHEREAS, the establishment of full-time local health service is at times a problem involving governmental reorganization and difficult financing, therefore be it

RESOLVED, that the American Public Health Association commend the activities of the National Health Council and its associated organizations for the efforts expended, with the hope that such efforts will continue unabated.

NEW A.P.H.A. MEMBERSHIP DIRECTORY

A new *Directory* of members, Fellows, and other constituents of the American Public Health Association, the first since 1946, is being published. A joint project of the Association and Health Publications Institute, Inc., the new volume is scheduled to appear late in December.

The main portion of the *Directory* will contain an alphabetical listing of the name, address, degree, current position and title, membership classification, and Section affiliation. The new edition differs from its predecessor in that the alphabetical listing will contain all the biographical and address information. Heretofore, this information was listed in the geographical section.

A complete roster of all names will also be classified in a geographic section.

The Association was responsible for the compilation and the complete con-

tent of the *Directory*, based on information supplied by the members themselves, and supplemented by information available from Association files and records.

The publication, sale, and distribution of the *Directory* will be handled by Health Publications Institute, Inc., Raleigh, N. C. The Institute, which is a non-profit publisher of health education materials, announces that the price, based on cost, will be $5.00 per copy. Orders should be sent directly to the Institute in Raleigh.

RISE IN ASSOCIATION DUES EFFECTIVE JANUARY 1, 1952

Recognizing the rising costs of providing services to members of the Association, among them the *American Journal of Public Health*, the Governing Council at its meeting in San Francisco on October 31, 1951, amended the By-Laws to establish annual membership dues at $10 and Fellowship dues at $15, as of January 1, 1952. The subscription fee of the *Journal* was established at $10.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the Sections indicated.

Health Officers Section

Jean C. Antonmattei, M.D., 102½ E. 4th St., Hobart, Okla., Medical Director, Kiowa-Tillman Counties Health District

A. F. Balkany, M.D., M.B., Dawson Creek, B. C., Canada, Medical Officer of Health, Peace River Health Unit

Catherine M. Balkema, M.D., 300 Main St., Lafayette, Ind., Member, Lafayette City Board of Health

Stevens Byars, M.D., 624 S. Sixth St., Union City, Tenn., Director, Lake-Obion Dist. Health Dept.

George W. Hicks, M.D., Jackson County Health Dept., Pascagoula, Miss., Director

Victor H. Hough, M.D., M.S., Box 175, Independence, Calif., Public Health Officer, Inyo County Health Dept.

Nancy E. Lautzenheiser, M.D., Keams Canyon, Ariz., Senior Reservation Medical Officer, U. S. Indian Service

Chester L. Nayfield, M.D., Jefferson County Health Dept., P. O. Box 152, Monticello, Fla., Health Officer

O. E. Puckett, M.D., County Health Office, Carlsbad, N. M., District Health Officer

M. P. G. Rawlinson, B.M., D.P.H., Box 492, Stettler, Alta., Canada, Medical Officer of Health, Stettler-Camrose Health Unit

Russell E. Teague, M.D., M.P.H., South Office Bldg., Harrisburg, Pa., Secy. of Health, State Dept. of Health

Siegfried Wagner, M.D., Neufahrn Bei Freising OBB, U. S. Zone, Bavaria, Germany, Health Officer, Freising City and County Health Dept.

Jack J. Williams, M.D., M.P.H., 130 S. American St., Stockton, Calif., Asst. Dist. Health Officer, San Joaquin Local Health District

Laboratory Section

Hester A. Austin, Health Bureau Laboratories, Medical School, Rochester 20, N. Y., Reprint Librarian, Dept. of Bacteriology, Univ. of Rochester Medical School

Mary L. Banks, 710 McKinley Ave., Montgomery, Ala., Assoc. Bacteriologist, State Health Dept.

Thelma B. Bruce, 4622 Edgewood Ave., Oakland 10, Calif., Cytologist, Alameda County Health Dept.

Warren S. Dobson, M.S., 318 E. Locust St., Bloomington, Ill., Training Officer and Asst. Sanitarian (R), Bloomington Field Training Center, Public Health Service

Thelma Gosney, 1655 Rodney Drive, Los Angeles 27, Calif., Director of Control, Courtland Laboratories

Arthur E. Greene, M.Sc., 2019 Bleigh Ave., Philadelphia 15, Pa., Student, Philadelphia College of Pharmacy and Science

Maynard S. Hart, M.D., 415 E. Yandell, El Paso, Tex., Clinical Pathologist, Hotel Dieu Hospital

Doris H. Lasater, 139 Lunado Way, San Francisco, Calif., Bacteriologist, City Health Dept.

Esther V. Laue, 1122 Grand St., Alameda,

Calif., Public Health Bacteriologist, Alameda City Health Dept.

Constance Mountain, Bender Hygienic Laboratory, 136 S. Lake Ave., Albany, N. Y., Chief Bacteriologist

Emogene L. Simmonds, 213 East Henley St., Olean, N. Y., Senior Bacteriologist, Cattaraugus County Health Dept.

Statistics Section

Roberto Fuentes, Bureau of Cancer Control, Dept. of Health, San Juan, P.R., Biometrician

William D. Hickerson, M.D., Med. Dept., Union Central Life Insurance Co., 3rd and Vine Sts., Cincinnati, Ohio, Asst. Medical Director

Carl F. Kossack, Ph.D., Statistical Laboratory, Purdue Univ., Lafayette, Ind., Director, Statistical Laboratory and Professor of Mathematics

Arline Lewis, 655 Powell St., San Francisco 2, Calif., Asst. Public Health Analyst, State Dept. of Public Health

Marie K. E. Nordsieck, 607 South J. St., Richmond, Ind., Public Health Specialist, Public Health Service

Evelyn Seaver, 900 Public Safety Bldg., Seattle, Wash., Supervisor, Dept. of Public Health Statistics, Seattle-King County Health Dept.

Engineering Section

Daniel J. Allison, P. O. Box 6506, Houston 5, Tex., Chief Engineer, Ayrshire Corp.

Simon H. Ash, E.M., 8406 Galveston Rd., Silver Spring, Md., Chief, Safety Branch, Bureau of Mines, U. S. Dept. of Interior

Richard D. Coleman, M.S.S.E., Bureau of Vector Control, 2180 Milvia St., Berkeley, Calif., Sanitary Engineer, Public Health Service

James B. Coulter, 4 Chalmers Court, Greenhills, Ohio, Asst. Sanitary Engineer, Public Health Service

Robert D. Cowan, Box 197, Temple Village, Alexandria, Va., Public Health Engineer, District of Columbia Health Dept.

Edwin S. Doyle, 1950-6th St., Berkeley 2, Calif., Sanitarian, National Canners Assn. Western Branch Research Laboratory

Morton I. Goldman, M.S.E., Public Health Service, 1014 Broadway, Cincinnati, Ohio, Asst. Sanitary Engineer and Lecturer, Radiological Health Training Section

Frank P. Henry, 15 Elmira St., Brighton 35, Mass., Inspector, Boston Health Dept.

Francis W. Montanari, M.C.E., Apartado 23-Bis, Mexico City, Mexico, Chief Engineer, Mexican Field Party, Health and Sanitation Division, Institute of Inter-American Affairs

John P. Nordin, 1760 East 62nd St., Seattle 5, Wash., Sanitarian, Seattle-King County Health Dept.

Curtis E. Richey, M.S., 441 Federal Office Bldg., San Francisco 2, Calif., Asst. Basin Engineer, Public Health Service

William J. Schreibeis, 1065 Bush St., San Francisco, Calif., J. A. Sanitary Engineer, Public Health Service

Industrial Hygiene Section

James Q. Gant, Jr., M.D., 1726 M. St., N.W., Washington 6, D. C., Private Practice of Dermatology

Otto T. Mallery, Jr., M.D., University Hospital, Ann Arbor, Mich., Director, Institute of Industrial Health, Univ. of Michigan

Charles C. Scoles, 1283 Poplar St., Denver, Colo., Sanitarian II, Dept. of Health and Hospitals, City and County of Denver

Food and Nutrition Section

R. Paul Elliott, M.S., Rm. 512 Federal Office Bldg., San Francisco, Calif., Bacteriologist, U. S. Food and Drug Administration

Rebecca J. Grass, M.S., 213 Hickox, Santa Fe, N. M., Asst. in Home Economics Research, New Mexico College of Agriculture and Mechanic Arts

Mary E. Sullivan, Cleveland District Dairy Council, Cleveland, Ohio, Director

Kathleen Thody, 101 Grove St., San Francisco, Calif., Nutritionist, San Francisco Dept. of Public Health

Joan M. Woodhill, D.Sc., 2 Locksley St., Killara, New South Wales, Australia, Research Fellow, King George and Queen Mary Maternal and Infant Welfare Foundation

Maternal and Child Health Section

Harry Bakwin, M.D., 132 East 71 St., New York 21, N. Y., Professor of Clinical Pediatrics, New York Univ.

Adriane V. Duffy, M.S., Box 28, Williston, Vt., Medical Social Work Consultant, State Health Dept.

Donald Harting, M.D., M.P.H., 69 W. Washington St., Chicago 2, Ill., Regional Medical Director for Chicago, U. S. Children's Bureau

Harold I. Tarre, M.D., 3810 Atlantic Ave., Long Beach 7, Calif., Pediatrician, Los Angeles County Health Dept.

Gabrielle Woloshin, 113 Howe St., Chicago, Ill., Student, Yale Dept. of Public Health

Public Health Education Section

Helen K. Bass, M.S.P.H., 1240 Neidt, Colum-

bia, S. C., Health Educator, South Carolina Tuberculosis Assn.

Donald A. Beegle, M.S., 538 N. E. Ivy St., Portland 12, Ore., Health Educator, Clackamas County and Multnomah County Tuberculosis and Health Assns.

Margaret E. Blaney, 467 O'Farrell, San Francisco, Calif., Program Director, California Division, American Cancer Society

Patricia E. Cauley, M.Ed., 8 Carruth St., Dorchester, Mass., Health Education Coordinator, Boston Health Dept.

Edna L. Foster, Box 1321, Juneau, Alaska, Health Education Technician, Alaska Dept. of Health

Dorothy C. Frost, J.D., 611 S. Lorraine Blvd., Los Angeles 5, Calif., Exec. Secy., Venereal Disease Council

Marjorie M. Harrison, M.P.H., 224 South 21st St., San Jose, Calif., Health Educator, San Jose City Health Dept.

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Helen A. Kardys, 839 Howard Ave., New Haven, Conn., Student, Yale Dept. of Public Health

Tadao Miyasaka, M.D., 1–172 Amanuma, Suginami-Ku, Tokyo, Japan, Technical Official, Health Center Section, Public Sanitation Bureau, Ministry of Welfare

Irma Z. Rodenhouse, M.S., 4808 Burke Ave., Seattle 3, Wash., Health Education Teacher, Seattle Public Schools

Eldra Shulterbrandt, Ed.M., Dept. of Health, St. Thomas, Virgin Islands, Psychologist

G. Elizabeth Vogel, M.P.H., Rm. 409, 45 Second St., San Francisco, Calif., Assoc. in Social Research, California Tuberculosis and Health Assn.

Lloyd L. Wagnon, M.S., 642 North 5th, Milwaukee 3, Wis., Milwaukee County Program Secy., Wisconsin Heart Assn.

Harry Wettig, Jr., 547 North and South Rd., University City 5, Mo., Public Health Advisor, Venereal Disease Division, Public Health Service

Mary H. Williamson, M.A., 115 S. Ellsworth Ave., San Mateo, Calif., Exec. Secy., San Mateo County Tuberculosis and Health Assn.

Ferne Willis, M.P.H., Muscogee County Health Dept., P. O. Box 229, Columbus, Ga., Health Educator

Florence R. Wyckoff, Rt. 5, Box 507, Watsonville, Calif., Member, California State Youth Committee

Patricia Yelle, 532 Worcester St., Wellesley Hills 82, Mass., Health Educator, Massachusetts Division, American Cancer Society

Public Health Nursing Section

Bernice J. Agar, R.N., Sandia Base Public Health Dept., Albuquerque, N. M., Army Public Health Nurse

Irene F. Anderson, Box 133, Loma Linda, Calif., Supervisor, Loma Linda Dispensary, Loma Linda Sanitarium and Hospital

Frances J. Clink, 659 Liberty St., Ashland, Ore., Public Health Nurse, Jackson County Health Dept.

Eva A. Cratt, P. O. Box 518, Washington, N. C., Acting Supervising Public Health Nurse, Beaufort County Health Dept.

Sibyl C. Davis, R.N., A.M., 11710 S. Homan, Chicago 43, Ill., Supervising Nurse, Cook County Dept. of Public Health

Mary M. Earl, M.A., 1859 Summit St., Toledo 11, Ohio, Asst. Director, Toledo Health Dept.

Mary L. Felkins, R.N., P. O. Box 631, Santa Maria, Calif., Asst. Director of Public Health Nurses, Santa Barbara County Health Dept.

Marie E. Goik, R.N., 2100 Spring Drive, Louisville, Ky., Mental Health Nurse Consultant, Univ. of Louisville Medical School and Louisville and Jefferson County Health Dept.

Beatrice R. Goodrich, 255 Central Ave., San Francisco 17, Calif., Public Health Nurse, City-County Dept. of Health

Marjory M. Jensen, 681–58th St., Oakland, Calif., Staff Nurse, Alameda County Health Dept.

Virginia B. Maxwell, R.N., 2 Bouie Circle, Rockville, Md., Public Health Nurse Specialist, Montgomery County Health Dept.

Laura L. Moorhead, Contant No. 106, Charlotte Amalie, St. Thomas, Virgin Islands, Director of Public Health Nurses, Dept. of Health

Alice Mori, 2191 Pine St., Apt. 7, San Francisco 15, Calif., Staff Public Health Nurse, San Francisco Health Dept.

Virginia E. Orr, 1416 Highland Blvd., Hayward, Calif., Staff Nurse, Alameda County Health Dept.

Minnie-Mae Roberts, 201–A Santa Rosa Ave., Oakland, Calif., Staff Public Health Nurse, Alameda County Health Dept.

Henrietta S. Smith, Box 52 North, Fort Bragg, Calif., (Inactive in public health nursing at present time)

Inalane M. Snow, 1625 Van Ness Ave., San Francisco, Calif., Director, Nursing Service, San Francisco Chapter, American Red Cross

Ruth I. Telinde, M.A., 1038 N. Cass St., Milwaukee, Wis., Exec. Director, Milwaukee Visiting Nurse Assn.

Louise M. Thoma, R.N., 2471 Roosevelt Drive,

Alameda, Calif., Public Health Nurse, Alameda County Health Dept.

Helen M. Wolfe, M.P.H., 328–32nd St., Richmond, Calif., Director of Public Health Nursing, Richmond Health Dept.

Epidemiology Section

Harold Mazur, M.D., M.A., 5121 Franklin Ave., Los Angeles 28, Calif., Medical Director, Los Angeles County Harbor General Hospital

Lt. Jack W. Millar (MC) USN, 24 Nathaniel Rd., Winchester, Mass., Medical Officer, U. S. Navy

Jesus Villalobos M., M.D., Unidad Sanitaria, Maracaibo, Venezuela, S. A., Epidemiologist, Ministry of Health

School Health Section

Grayce B. Leidig, R.N., 120 W. School St., Visalia, Calif., Coördinator of School Nursing, Tulare County Schools

Janice L. Levin, 3701 West Way, Sacramento, Calif., School Nurse, Rio Linda School

James W. Long, M.A., 112 Wingate, Wake Forest, N. C., Asst. Director, Dept. of Physical Education, Wake Forest College

Helen Padan, P. O. Box 717, Fairfield, Calif., Supervisor of Health, Solano County Schools

Dental Health Section

William L. Barnum, D.M.D., 559 Morgan Bldg., Portland 5, Ore., Supervisor, Dental Division, Portland Public Schools

Perley M. Cunningham, D.D.S., 511 Hynds Bldg., Cheyenne, Wyo., General Dental Practice

David R. Wallace, D.D.S., 233 Main St., Brookville, Pa., District Dental Officer, State Dept. of Health

Lois S. Williamson, State Health Dept., Bismarck, N. D., Senior Dental Hygienist

Medical Care Section

Hubert J. Barnes, M.P.H., 204 Yale Ave., Berkeley 8, Calif. (Unemployed at present)

Lillian H. Erickson, Rm. 3332 Federal Security Bldg. So., Washington, D. C., Asst. Chief, Medical Record Branch, Division of Hospitals, Public Health Service

Thomas I. Fulton, 235 Franklin St., Johnstown, Pa., Rehabilitation Specialist, Area Medical Office, UMWA Welfare & Retirement Fund

Thomas F. Gorman, 2501 Calvert St., N.W., Washington, D. C., Health Legislation Specialist, Democratic National Committee

Mary L. Hemmy, M.A., 507 South Euclid Ave., St. Louis 10, Mo., Director, Social Service Dept., Washington Univ. Clinics and Allied Hospitals

Yuki Kato, 1127 Pine St., St. Louis 12, Mo., Administrative Assistant to the President, Labor Health Institute, Inc.

Leonard S. Krassner, M.S., 17 Anthony St., New Haven, Conn., Assistant-in-Teaching and Graduate Student, Yale School of Public Health

Benjamin Lieberman, M.D., 1440 Broadway, Oakland 12, Calif., Private Practice

Donald R. Lutz, 1630 University Ave., Berkeley, Calif., Administrative Interne in Medical Care, Permanente Hospitals

E. Gwyn Roberts, M.D., 450 Sutter St., San Francisco, Calif., Research Assoc. in Medicine, Stanford Univ. School of Medicine

Carl J. Ross, 50 Arlington Ave., Berkeley 7, Calif., Exec. Director, Mt. Diablo Therapy Center

Martha L. Rupp, M. A., 624 South Clinton, Iowa City, Iowa, Medical Social Worker, University Hospitals

Thea Sando, 511 E. Washington, Iowa City, Iowa, Medical Social Worker, University Hospitals

Edwin J. Simons, M.D., Minnesota Medical Service, Inc., 2610 University Ave., St. Paul, Minn., Medical Director

Milton H. Sisselman, 327 Whalley Ave., New Haven 11, Conn., Student, Yale School of Public Health

Margaret S. Skillman, M.A., 9 Equitable Bldg., Denver, Colo., Regional Medical Social Consultant, U. S. Children's Bureau

Thomas E. Tonkin, M.P.H., 1020 North Rush St., Chicago 11, Ill., Office Manager, Commission on Financing of Hospital Care

Dietrich V. Wiebe, M.D., 2841 Marilona Drive, Sacramento 15, Calif., Saco Area Medical Officer, Bureau of Indian Affairs

Unaffiliated

Horace V. Bell, 11138 S. W. 53rd St., Portland 19, Ore., Administrative Asst., Portland Bureau of Health

Charles R. Bobertz, M.B.A., 2164 Ashby Ave., Berkeley 5, Calif., Coordinator, Oakland Emergency Medical and Radiological Services

Nathalie Bucknall, City Health Dept., 116 Temple St., Los Angeles 12, Calif., Safety Services Coordinator

Bradley Buell, M.A., 58 Park Ave., New York 16, N. Y., Exec. Director, Community Research Associates, Inc.

Kam-Fai Chan, M.D., 295 Bennett Ave., New York 33, N. Y., Research Scholar, Colum-

bia University School of Public Health

Frances K. Herwig, M.D., Health Center, Kent State Univ., Kent, Ohio, Resident

Herman C. Menkel, M.D., 614 East 10th St., McMinnville, Ore., Medical Secy., Oregon Conference of Seventh-Day Adventists

Joseph B. Reichart, Westphalia, Mo., Accountant II, Missouri Division of Health

Woodruff Smith, M.D., 106 First St. So., Ladysmith, Wis., Member, State Board of Health

Marvin O. Stromberg, 767 Canyon Rd., Redwood City, Calif., Administrative Methods Consultant, U. S. Children's Bureau

Carl Sundin, 312 North Boyle Ave., Los Angeles 33, Calif., Medical Extension Secretary, General Conference of Seventh-Day Adventists.

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EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Medical Health Officer—for Wyoming County, New York, recently organized as a county health department. Population approximately 30,000. To work in close coöperation with county hospital. Salary open. Write: Mr. Harold L. Peet, Pike, N. Y.

Health Officer—for Missoula City-County Health Department, Missoula, Mont. Salary $9,177 per year, depending upon qualifications. Population 35,000, located in Western Montana, and has the State University. For further details, write: J. M. Nelson, M.D., Secretary, Missoula City-County Board of Health.

Physician—to serve as Health Director of the Shiawassee County Health Department at Corunna, Mich. Apply: Amby L. Gould, Carland, Mich.

Industrial Hygiene Engineer—for state health department. Must be graduate of a recognized college, university, or technical school with a degree in civil, chemical, mechanical, sanitary, industrial hygiene, or public health engineering. Annual salary $4,200, with prospects of advancement. Apply: Dr. S. J. Phillips, State Health Officer, Louisiana State Department of Health, New Orleans 7, La.

Senior Public Health Nurse—rural area, northwestern Ohio. Generalized program, 60,000 population. State retirement plan. Health training, minimum 2 years; supervised experience in generalized program. Beginning salary $3,000, with $60 per month travel in own car.

Public Health Nurse—for generalized program in rural area, population 60,000. State retirement plan. Beginning salary $230, plus $60 travel in own car. Write: Wood County Department of Health, Bowling Green, Ohio.

Assistant Health Officer—Arlington County, Virginia. Requirements: graduate of Class A medical school; eligible for Virginia license; 1 year postgraduate study in public health at an approved school or equivalent in experience. Salary range $5,620–7,060. Transportation for official duties; retirement for those under 39; 5 day week. Health Department accredited for residency training for physicians qualifying for the American Board of Preventive Medicine and Public Health; affiliation with several universities for training postgraduate students. An opportunity to work in one of the most modern and up-to-date health departments in the nation. Address: Personnel Director, Court House, Arlington, Va.

Qualified Public Health Nurses and Sanitarian—for generalized program in rural, resort area of Southwestern Michigan. Salary commensurate with experience and qualifications; basic travel of $36 per month plus 4 cents per mile; liberal personnel policies, including 4 weeks annual vacation. Active public health training center. Write: A. B. Mitchell, M.D., Medical Director, Van Buren County Health Department, Paw Paw, Mich.

Medical Health Officer—for Shelby-Effingham County Health Department; Central Illinois location; good schools; excellent rural communities. Salary range $6,900–9,000; may start above minimum. Must have capacity for good public relations. Write: Mr. J. H. Griffin, Teutopolis, Ill., or Dr. O. G. Kauder, Finlay, Ill.

Interesting employment for the **Veterinarian** who wants to help develop the field of veterinary public health. Address: Dr. W. B. Prothro, Director, Kalamazoo City-County Health Department, City Hall, Kalamazoo, Mich.

Supervising Public Health Nurse, $303–375, and Staff Public Health Nurse, $273–337. Ability to secure California R.N. and Public Health Nursing licenses required. Forty-hour week, vacation, sick leave, retirement. Ideal climate and recreational area. Well-financed, diversified program. Apply: Orange County Personnel Department, 644 N. Broadway, Santa Ana, Calif.

Medical Director—must be eligible for Tennessee medical license and have training (M.P.H.) and experience in public health administration; some training in industrial hygiene or medicine preferred. To direct a state **industrial hygiene** program with a staff consisting of a medical officer, 2 nurses, 4 engineers, 3 chemists and 2 office assistants; laboratory with $30,000 field and laboratory equipment. Opportunity for teaching in two medical schools. Write: Dr. R. H. Hutcheson,

Commissioner, Tennessee Department of Public Health, Nashville, Tenn.

City of Hartford, Connecticut. Announcement. Open Competitive Examination. **Public Health Engineer.** Salary range $4,614–5,502 per annum. Open to resident citizens of the United States. Successful applicant will be required to take up residence in Hartford. Applications will be accepted until a sufficient number of candidates have filed for examination. Applications should be filed with: City of Hartford, Department of Personnel, 550 Main St., Hartford, Conn.

Rehabilitation Consultant—for an unusually attractive coördinating project in the Philadelphia area. Demonstration program to be conducted for 3 years. Salary range $5,000–6,500, depending on qualifications. Write: Clyde E. Arbegast, Health Division, Health and Welfare Council, 311 S. Juniper St., Philadelphia 7, Pa.

Experienced Public Health Physician—for regional health officer in field office of state department of public health. Salary range $575–860 per month. Starting salary will relate to experience and training; successful local health department experience important. Specialty Board desirable. Write: Roland R. Cross, M.D., State Health Officer, Capitol Bldg., Springfield, Ill.

Health Officer—for newly created Egyptian Health Department located in "Little Egypt" section of southern Illinois and serving the counties of Gallatin, Saline, and White. Position to begin January 1, 1952, or as soon thereafter as possible. Candidate should be prepared to create and maintain a good program of local health service and should have capacity for excellent public and human relations. Salary range $9,000–11,000. Beginning salary will depend on experience and training. Write: Mr. Horace Brown, Secretary, Egyptian Board of Health, Shawneetown, Ill.

Immediate opening for an experienced **Milk Sanitarian**—in an established health department in Southwestern Washington. Mileage and expenses; Merit System protection and retirement plan. Write: Donald A. Champaign, M.D., Cowlitz-Wahkiakum District Public Health Department, Court House, Kelso, Wash.

Public Health Nurse—generalized program, official agency; field training center; rural county, 26,000 population; health department and hospital coördinated under one medical director, health department located in hospital. Opportunity to work in developing program. Salary $2,700–3,300, depending on education and experience. Liberal travel allowance. Apply: Vergil N. Slee, M.D., Director, Barry County Health Center, Hastings, Mich.

Public Health Medical Officer—school health program. Public health training preferred; must have or be eligible for California license. Salary $507 per month, with an increase to $647 at end of 6 months. Must have car, mileage allowed at 7 cents. Write: County Civil Service, 236 Third St., San Bernardino, Calif.

Industrial Hygiene Engineer—salary $375–440; mileage; civil service position; retirement. For further information, contact: Dr. Roy O. Gilbert, Health Officer, Los Angeles County Health Department, 808 N. Spring St., Los Angeles 12, Calif.

Medical Health Officer—for Lawrence-Wabash County Health Department. Salary range $7,200–8,400; may start above minimum. Must have capacity for good public relations. Write: Roy R. Rucker, Secy.-Treas., Lawrence-Wabash Health Department, Lawrenceville, Ill.

Two Physical Therapists—immediate employment. Preference given to graduates of approved schools of physical therapy. Agency program offers service to crippled children under medical prescription to patient in the clinic; includes care of cerebral palsy, post-poliomyelitis, and other crippling conditions. Five-day week; liberal holidays. Write: R. G. Forbes, Personnel Director, Court House, Arlington, Va.

Public Health Director—for City of Grand Rapids, Mich. Must be licensed to practise medicine in Michigan. Salary $9,000–12,000. Write: John Iglauer, Deputy City Manager, Grand Rapids, Mich.

Health Educator — (Montgomery County, Maryland). Salary $4,200–5,000. In health unit of 86 full-time employees. Suburban and rural area adjacent to Washington, D. C. Active participation of volunteer organizations. Minimum qualifications include 2 years experience and bachelor's or preferably a master's degree in public health. Write: Personnel Office, Court House, Rockville, Md.

Nursing Supervisor — Small County Health Department. Salary $4,200. Forty hour week. Mileage allowance, must have own car. Qualifications as set up by N.O.P.H.N. County includes High Sierra Mountains and scenic Death Valley. Write: Inyo County Health Department, Independence, Calif.

Several qualified **Public Health Officers** are needed in Texas. Salary $7,200, plus a necessary travel allowance. Write: Geo. W. Cox, M.D., State Health Officer, Austin, Tex.

POSITION WANTED

Former **Venereal Disease Education Supervisor,** state health department—desires position with official or voluntary health organization. Experienced in preparation, presentation, and placement of health education material, all media. Journalism degree, with specialized training in health and human relations. Write: Box **HE-39,** Employment Service, A.P.H.A.

Health Educator—associated with a prepayment health plan and group medical practice and formerly with an official City health agency; plus several years of teaching and directing health programs. Interested in a position in industrial health education. Master's degree in health education, five years' experience with community health education. Male, 34, married, one child. Resume will be sent upon request. Write: Box **HE 40,** Employment Service, A.P.H.A.

All communications should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE FOR THE FOLLOWING: (a) PUBLIC HEALTH PHYSICIAN to direct school health program; school enrollment, 97,000; university city, 700,000; opportunity medical school appointment; West. (b) COMMISSIONER OF HEALTH; university town, 70,000, Midwest. (c) PUBLIC HEALTH PHYSICIAN qualified to direct student health department, one of country's largest universities; outstanding man required. (d) ASSISTANT HEALTH OFFICER; city-county health department; California. (e) ASSOCIATE PROFESSOR OF HEALTH EDUCATION; preferably woman with doctorate; graduate and undergraduate students; state university; around $6,000 for school year. (f) DIRECTOR OF NURSES; city health department, Pacific Coast; staff of 30; generalized program including school nursing. (g) PUBLIC HEALTH NURSE SUPERVISOR interested community organization, public relations; city health department; Midwest. (h) SCHOOL NURSE; county seat town; California; attractive location. (i) STAFF NURSES; county health department; college town, Pacific Coast; car furnished. (j) NUTRITIONIST to serve as consultant, tuberculosis association; Midwestern metropolis. (k) SANITARIAN; Asia; $7,000. (l) HEALTH EDUCATOR and, also, PUBLIC HEALTH NURSING SUPERVISOR; county-city health department; Northwest. (m) DIRECTOR OF PUBLIC HEALTH NURSING; important medical care program; East. (If you will write for our ANALYSIS FORM, we shall prepare an individual Survey of opportunities which meet your requirements.)

Please direct all inquiries to BURNEICE LARSON, THE MEDICAL BUREAU, PALMOLIVE BUILDING, CHICAGO.

WANTED — OPPORTUNITIES FOR THE FOLLOWING—(a) PUBLIC HEALTH PHYSICIAN; D.P.H.; 11 years' administrative experience in public health; Diplomate, American Board. (b) PUBLIC HEALTH NURSE; Master's Columbia University; eight years' public health experience in supervising capacities; past three years, assistant director of nurses, metropolitan health department. (c) HEALTH EDUCATOR; M.A., Michigan; six years, health educator, county tuberculosis and health department. (e) PUBLIC HEALTH DENTIST; eight years, director, state department of public health dentistry. (f) SANITARY ENGINEER; Master's degree in Chemical Engineering (Major: Sanitary Engineering); five years, sanitary engineer, state department of health.

Please direct all inquiries to BURNEICE LARSON, THE MEDICAL BUREAU, PALMOLIVE BUILDING, CHICAGO.

NEWS FROM THE FIELD

INTERNATIONAL UNION FOR HEALTH EDUCATION OF THE PUBLIC

A nongovernmental agency under the name of International Union for Health Education of the Public was organized in Paris, France, during May, 1951, at which time 21 countries were represented. Clair E. Turner, Dr.P.H., of New York, assistant to the president of the National Foundation for Infantile Paralysis and emeritus professor of public health at the Massachusetts Institute of Technology, is serving as president of the Interim Commission. According to an announcement, it is expected that a constitution will be adopted and a permanent organization established at the next meeting in Paris in 1952. Meanwhile, the headquarters of the organization are at 7 Rue de Tilsitt, Paris XVII, France. The Secretary-General is M. Lucien Viborel, director of health education for the French Ministry of Health.

STAFF CHANGES IN DIVISION OF INTERNATIONAL HEALTH, P.H.S.

According to an October announcement, the new chief of the Education and Training Branch, Division of International Health, Public Health Service, Washington, is Howard M. Kline, Ph.D. Dr. Kline succeeds Henry R. O'Brien, M.D., M.P.H., who has been assigned to the Bureau of State Services, P.H.S. At the same time, Dr. Henry C. Niblack, who has been assistant chief of the branch, was appointed fellowship program director. This position was created because of the increasing number of foreign specialists studying in the United States under fellowships sponsored by the Economic Cooperation Administration, Point IV, and the military, by international agencies, by foreign governments, and by private organizations here and abroad. During the past two years the branch has arranged and supervised professional training in the United States for over 1,000 foreign physicians and other health workers.

Dr. Kline has been chief of the Technical Missions Branch, Division of International Health, Public Health Service. Other assignments have included that of technical secretary of the Subcommittee on Medical Care, American Public Health Association; adviser on medical research to the President's Scientific Research Board; executive secretary, National Health Assembly; staff director of the Committee on Medical Services, Committee on Organization of the Executive Department; and secretary of the Surgeon General's Committee on Medical School Grants and Finances.

HEALTH CENTER DESIGNS

Public health workers concerned with health center design and construction will be interested in the October, 1951, number of the *Architectural Record* (119 West 40th Street, New York, N. Y.) with its section on Hospitals and Health Centers.

In addition to describing design for general hospitals, mental hospitals, tuberculosis units, and heart hospitals, the issue contains a section by John W. Cronin, M.D., chief of the Division of Hospital Facilities, Public Health Service, on housing for public health activities. There is also a section on the urban public health center by Anthony J. Borowski, Dr.P.H., chief of the Division of Hospital Facilities in the Ohio State Department of Health. Other articles include designs for large health and safety centers, combined hospitals

and health centers, and various health centers for local health units.

UNIVERSITY OF MINNESOTA MAKES ACHIEVEMENT AWARDS

The University of Minnesota, Minneapolis, recently presented 15 alumni of the university's College of Medical Sciences with "outstanding achievement award" medals. Among them, the following, all from the field of public health: Fred L. Adair, M.D., Raymond B. Allen, M.D., Alma C. Haupt, R.N., Herman E. Hilleboe, M.D., Pearl McIver, R.N., James E. Perkins, M.D., Edith L. Potter, M.D., and William P. Shepard, M.D.

AIR POLLUTION

An *Air Pollution Abatement Manual*, to consist of 12 separate chapters, is being published by the Manufacturing Chemists' Association, Inc., to guide the chemical industry in achieving abatement of air pollution by the most practicable means. Each chapter will be printed separately, punched for loose-leaf binding. Sampling, analytical methods, and specific methods of control will be discussed. The Introduction and Community Relations chapters have already been published. Further information from MCA, 246 Woodward Bldg., Washington 5, D. C.

DENVER DIVORCES HEALTH AND WELFARE

By vote of the citizens on June 1, 1951, the City of Denver amended its charter to create two new departments —one on health and hospitals and one on public welfare. Hitherto, there had been a Department of Health and Charities.

The Department of Health and Hospitals is governed by a seven member board appointed by the Mayor and so constituted that no one profession has a majority of the members, who serve for staggered terms of five years. Florence Sabin, M.D., the author and promoter of the 1947 revision of the state's basic public health law and for the past several years manager of the now extinct Department of Health and Charities, is a member of the Board. James P. Dixon, M.D., who has been the manager of the Bureau of Health and Hospitals, is the manager of the new Department of Health and Hospitals. Denver has thus joined the considerable group of health departments in the country having responsibility for both public health and medical care for the indigent.

A NEW KIND OF COURT

Chicago has a new kind of court—a health court specializing in violations of the antiragweed ordinance which requires property owners to cut ragweed twice a year on vacant property. Established by the Chief Justice of the Municipal Court, Edward S. Scheffler, it is designed to operate annually on a full-time basis during the hay fever season. Heavy fines will be levied against property owners failing to carry out the ragweed ordinance.

STANDARD METHODS IN GERMAN

The Ninth Edition of *Standard Methods for the Examination of Water and Sewage* has now been translated into German. The translation was made by Dr. F. Sierp of the Ruhrverbände-Essen, with a foreword by Dr. Karl Imhoff. Copies available from R. Oldenbourg, Munich.

TWO-THIRDS OF BLINDNESS NEEDLESS

The Maryland Society for the Prevention of Blindness in studying 104 blind persons found that 65 of them—nearly two-thirds—lost their sight needlessly. All 104 blind persons in the study were examined by ophthalmologists and eye clinics in the Baltimore area during a six month period. With the title, "Why Are They Blind?" the study is reported

in the fall issue (21:3) of the *Sight Saving Review.* National Society for the Prevention of Blindness, 1790 Broadway, New York 19.

INDIAN HEALTH SERVICES CONSOLIDATED

The Oklahoma State Department of Health and the U. S. Bureau of Indian Affairs have consolidated their separate health services to the Five Civilized Tribes of Eastern Oklahoma. Both programs will now be administered by the county health officer in counties that are covered by full-time health departments. The state health officer, G. F. Mathews, M.D., in explaining the consolidation, said, "It has long been recognized by leaders in the field of public health that all official health agencies in a given community can 'be administered more efficiently as one agency.' Such a procedure will provide better utilization of facilities and prevent duplication and overlapping of services."

Oklahoma is said to be the first state in the nation where so extensive a consolidation has been made. Similar agreements have been worked out in single counties in other states.

GROWTH AND DEVELOPMENT OF CHILDREN

During the first two weeks of October, the Harvard School of Public Health was host to 35 public health social workers attending the Institute on the Growth and Development of Children. Here these workers from 20 states observed the latest research on the physical, mental, and social growth of children being carried on at the school, the Children's Medical Center, and other institutions in the area.

The school's Department of Maternal and Child Health is headed by Harold C. Stuart, who is also chief of the Child Health Division of the Children's Medical Center. The department has been conducting a growth study for 20 years on a group of children from birth to adulthood. The study is based on the premise that children of the same age differ physically and mentally; the goal being to secure enough information to predict in advance what of the child's talents should be nurtured and what pitfalls to avoid. This study, together with the school's research into the far-reaching effects of diet during pregnancy and early infancy, were drawn upon by the institute.

Assisting Dr. Stuart as leader of the institute was assistant professor Elizabeth P. Rice of the School of Public Health.

GOLD HEARTS TO THREE PHYSICIANS

At the summer meeting of the American Heart Association, three physicians received the Association's highest tribute —its Gold Heart Award. Presented by the association's president, Louis N. Katz, M.D., the Award went to:

James B. Herrick, emeritus professor of medicine, University of Chicago, best known for his description of coronary thrombosis with myocardial infarction.

Frank N. Wilson, professor of medicine, University of Michigan, a major contributor to the field of electrocardiography.

H. M. Marvin, associate clinical professor of medicine, Yale University, identified with the association for a quarter of a century and its president in 1949–1950, who contributed greatly to popular literature and the lay educational program in the cardiovascular field.

INTERSTATE COUNCIL OF SANITARIANS

At a meeting in Chapel Hill, N. C., in July, 1951, an Interstate Council of State Administrative Sanitation was created. The forerunner of this council was a meeting in 1949 of a group to develop a uniform classification plan and adjustment of salaries for workers in environmental sanitation.

The new council hopes to develop professional status for sanitarians. J. B. Baker, chief sanitarian, Division of Sanitary Engineering, West Virginia

State Health Department, was elected chairman of the new organization, which includes representatives from the five states known as the Charter States—Georgia, North Carolina, South Carolina, Virginia, and West Virginia. Florida and Maryland have been invited to have representation on the council.

CANCER RESEARCH SCHOLAR GRANTS

The American Cancer Society announces that a limited number of cancer research scholars will be appointed for a period beginning July 1, 1952. On recommendation of the Committee on Growth of the National Research Council, a grant of $18,000, payable over three years, will be made by the Society to the scholar's institution toward his support or research or both. Medical schools, hospitals, research institutes, and other institutions with a substantial interest in cancer research are invited to submit applications for these grants. Applications for grants to be effective July 1 should be submitted prior to January 1, 1952. Further information and application forms from the Executive Secretary, Committee on Growth, National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C.

The society also announces that inquiry regarding Damon Runyon Clinical Fellowships, formerly recommended by the Committee on Growth, should now be addressed to the Damon Runyon Memorial Fund, Hotel Astor, New York 19.

KANSAS CITY DAILY FLOOD BULLETINS

The *City Manager's Flood Bulletin*, published daily during the recent Kaw River floods by the City Manager's office in Kansas City, Mo., presented to city officials the day-by-day progress of efforts to repair city services. The first bulletin was issued on July 24 while the river was still at flood stage. Each bulletin covered the conditions and services as reported by the various city departments for the period 8 A.M. of one day to 8 A.M. of the following day. A single-sheet mimeographed report did the job.

FULL-TIME STAFF FOR IAMFS

The International Association of Milk and Food Sanitarians, by a recent action of its executive board, has established headquarters in the Ritz Building, Shelbyville, Ind. H. L. Thomasson, formerly with the Indiana State Board of Health, has been appointed full-time executive secretary and business manager of the *Journal of Milk and Food Technology*. He is also the president-elect of the International Association.

NEW CHAIR OF CLINICAL PREVENTIVE MEDICINE AT WESTERN ONTARIO

Authorities at the University of Western Ontario, London, Ont., have announced that under the will of John B. Maclean, the university has received $100,000 to establish the Michael Francis Fallon Memorial Chair of Clinical Preventive Medicine. Dr. George E. Hobbs, who has served as assistant dean of the Faculty of Medicine, has been named professor.

FOOD AND CIVIL DEFENSE

Representatives of the United States, Canada, and the United Kingdom discussed food supply and emergency feeding in wartime at a "Conference on Administration and Scientific Problems of Food Aspects of Civil Defense" which met in London November 23–December 13. The conference was divided into three sections: emergency feeding, which will include demonstrations by transportable kitchen units and curbside cooking; food administration, which will consider such problems as food distribution in a bombed town, salvaging food, maintenance of supplies, etc.; and scientific problems, where such things as emergency nutritional require-

ments, food sanitation and contamination will be discussed.

During the opening sessions, United Kingdom representatives described World War II experiences of the British Ministry of Food. Afterward the special sections met separately. Visits to English towns where specific food supply or feeding problems existed were made by each group and local food administrators explained how the problems were met.

United States delegates included members of federal, state and local civil defense organizations, representatives from the National Red Cross, and members of federal departments, such as Defense, Agriculture, Federal Security, and the Bureau of Census. FCDA people include Col. William L. Wilson, assistant administrator for health and welfare; Paul B. Murphy, chief, Food and Feeding Section; and James M. Hundley, M.D., consultant on nutrition, who presided over the Scientific Section as acting chairman.

Other A.P.H.A. members who participated in the Scientific Section are: D. K. Tressler, Ph.D., technical director of the Food and Container Institute of the Quartermaster Corps; Callie May Coons, Ph.D. assistant chief, Bureau of Human Nutrition and Home Economics, Department of Agriculture; Gordon E. McCallum, C. E., chief, Health Emergency Planning Office, Office of the Surgeon General, U.S.P.H.S.; Roy E. Butler, M.D., Office of Health Emergency Planning, FSA; C. G. King, Ph.D., scientific director, Nutrition Foundation, Inc.; George Uhl, M.D., health officer of the City of Los Angeles; Marjorie M. Heseltine, M.A., chief, Nutrition Section, Children's Bureau, Washington, D. C.

Homer Calver, secretary of the Public Health Committee of the Paper Cup and Container Institute and former executive secretary of the A.P.H.A., served as a special adviser on civil defense and was attached to both the scientific problems and the emergency feeding sections.

ADOLESCENT UNIT IN MEDICAL CENTER

The Children's Medical Center, a unit of the Children's Hospital in Boston, has begun the organization of an Adolescent Services Unit. Here, the center attempts to provide adolescents with the sort of special attention given to infants and young children for nearly a century. Heretofore adolescents have been cared for in surroundings intended primarily for either young children or adults. Particular attention will be devoted to conditions and problems most troublesome in the adolescent years—contagious diseases, psychological problems, growth and glandular disturbances, and scholastic difficulties, among others.

Director of the Adolescent Unit is J. Roswell Gallagher, M.D., consultant-in-medicine to the staff of the center, who for the past 20 years has devoted his attention exclusively to this age group. He is the author of *You and Your Health* and *Understanding Your Son's Adolescence*, the latter just published. He is a member of the Committee on Health Service Programs for Secondary Schools of the School Health Section, American Public Health Association.

DR. THEILER RECEIVES NOBEL AWARD

Dr. Max Theiler, New York City, of the staff of the Rockefeller Foundation Laboratories at the Rockefeller Institute for Medical Research, was the recipient of the 1951 Nobel Award in Medicine in recognition of his development of the yellow fever vaccine known as 17D which has proved effective in the prevention of this disease.

The American Public Health Association recognized Dr. Theiler with a Lasker Award in 1949. Dr. Theiler is the fifth recipient of a Lasker Award to receive the Nobel Award since these were established by the American Public

Health Association five years ago. The other persons so recognized are Dr. Carl Cori, Dr. Selman Waksman, Dr. E. C. Kendall, and Dr. Philip Hench.

ATOMIC ENERGY COMMISSION ANNOUNCES FELLOWSHIPS

Eight fellowships in industrial medicine have been announced by the Atomic Energy Commission for the 1952–1953 academic year, in continuation of a program that was launched in 1949. The announcement states that fellows do not incur an obligation to seek employment with the A.E.C. or its contractors. Stipends are $3,600 for the first year and $5,000 for the second, and are not subject to income tax. Persons interested should communicate with the A.E.C. Project, School of Medicine and Dentistry, University of Rochester, Rochester, N. Y., attention of Dr. H. A. Blair.

WHO NEWS

Brazzaville Regional Office

At the recent first meeting in Geneva of the Regional Committee for Africa, Brazzaville, capital of French Equatorial Africa, was selected as the site for the permanent Regional Office, which serves Africa south of the Sahara. Lieutenant General Francois Daubenton of The Netherlands was nominated as director of the permanent Regional Office, subject to ratification by the WHO Executive Board in January, 1952. General Daubenton has spent 30 years as medical officer in Africa and has been chief of the temporary WHO Office in Geneva for Africa. The next session of the Regional Committee will be held in Monrovia, Liberia, in August, 1952.

Among the programs planned for 1952 and 1953 are malaria control, nutrition, and sanitation programs, strengthening of public health services, and fellowships in public health and related specialized subjects, with a plan to give special emphasis to training of health and auxiliary personnel.

Activities in Southeast Asia

A summary of activities in the Southeast Asia Regional Office has recently been issued by the regional director, Dr. Chandra Mani, following the meeting of the Regional Committee in Rangoon in September. Among the items summarized are:

By the end of June, 1951, more than half a million persons in Indonesia and Thailand had been examined for yaws, with about 140,000 cases discovered and treated. This campaign was conducted by WHO and UNICEF in cooperation with the respective governments.

WHO has now taken over technical responsibility for BCG vaccination, begun in India and Ceylon in 1948 as a part of the International Tuberculosis Campaign. Since the campaign started, nearly 100 national teams in 18 states in India have been trained by international teams. By June 30, 1951, 4,000,000 persons had been tested and 1,300,000 vaccinated in India; 305,000 tested and 122,000 vaccinated in Ceylon.

UNICEF furnishes equipment and supplies for these projects and coöperates with WHO in helping governments to set up demonstration and training centers. Three centers are already operating in India and Burma and others are being developed.

Six malaria control demonstration projects have been in full operation during the year. Of four in India, two have been handed over to national health organizations; one is being expanded with the help of FAO; another, as well as one each in Afghanistan and Thailand, is continuing. The success of these projects has stimulated the Afghanistan Government to plan extension of malaria control to seven other areas, and the Thailand Government to cover the majority of its malarious areas within the next five years.

Maternal and child health projects are under way with UNICEF aid in several countries of Southeast Asia, with emphasis on training of nurses and other personnel in modern methods of care.

Health Statistics Training Course

A 12 week training course in vital and health statistics was recently held in Ceylon, jointly sponsored by the Ceylon Government, WHO, and the United Nations. It acquainted trainees

from several Asian and Pacific countries with modern developments in vital and health statistical methods, international regulations and codes in the field of health statistics, and current statistical programs.

The director was K. Williams, director of census and statistics in Ceylon, the secretary, A. J. Joseph, assistant permanent secretary of Ceylon's Ministry of Health. Among the lecturers provided by the Government of Ceylon, the UN, and WHO, was Dr. W. Thurber Fales, WHO consultant in health statistics and research associate of the Johns Hopkins School of Hygiene and Public Health.

Dr. Fales was in Southeast Asia in September for WHO, making a rapid survey of the health statistics situation in Thailand, Ceylon, Indonesia, and various parts of India.

For a Quick Look at Activities

Two recent publications are an aid in keeping up with WHO round the world without reading extensive reports. They are: (1) *World Health Organization Activities of 1950, A Summary of the Report of the Director-General.* In terms of the six regional offices—Africa, the Americas, Southeast Asia, Europe, Eastern Mediterranean, and the Western Pacific—and in terms of the individual countries aided, this report in some 16 pages summarizes the outstanding events in which WHO shared. It is a reprint from the *Journal of the American Medical Women's Association* and is available from the Public Information Office, WHO, United Nations, N. Y.

The other summary document (2) is *Resolutions and Decisions of the Fourth World Health Assembly,* taken from the official records of WHO. World Health Organization, Palais des Nations, Geneva, 50¢ or 2 Swiss francs.

CORRECTIONS

The Executive Secretary calls attention to an error which crept into an item headed "Public Health Horizons in Latin America" on page 1416 of the November issue of the *American Journal of Public Health.* It is stated there that the Pan American Sanitary Bureau (now a regional arm of WHO) has been revitalized "and has been organized as the Institute of Inter-American Affairs."

The statement as it reads, of course, is inaccurate and confusing. The original statement before it was edited read as follows: "Dr. Atwater emphasized the changes that had taken place during the last decade which had seen a revitalization of the work of the Pan American Sanitary Bureau (now a regional arm of WHO) and the organization of what is now called the Institute of Inter-American Affairs, an agency of the United States Government which, in coöperation with other countries in this hemisphere, has developed what is perhaps the most extensive international series of public health projects in existence."

ALTON BLAKESLEE is science writer of the Associated Press, not the United Press, as inadvertently stated on page 1292 of the October *Journal.*

PERSONALS

WILL H. AUFRANC, M.D.,* formerly VD control officer, Oregon State Health Department, who has been acting director of the Health Resources Office, National Security Resources Board, is now director of the Health Resources Staff, transferred to the Office of Defense Mobilization, Executive Office of the President.

ARTHUR C. BACHMEYER, M.D.,† professor at the University of Chicago's Division of Biological Science, has become professor emeritus but will continue as consultant for the Hospital Construction Program, now under way on the campus of the university.

M. H. BIDWELL,* formerly sanitary engineer with the Continental Air Command, U. S. Air Force, has been appointed director of environmental sanitation, Rochester (N. Y.) Bureau of Health.

ELIZABETH BISHOP, M.D., dsitrict health officer of a three county district in central Oregon

since 1946, is now director of maternal and child health and of the Crippled Children's Division of the Alaska Department of Health.

EARNEST BOYCE,* chairman of the Department of Civil Engineering, University of Michigan, was elected president of the Federation of Sewage and Industrial Wastes Associations at the recent meeting of the FSIWA in St. Paul. Professor Boyce was chairman of the Engineering Section, A.P.H.A., in 1940.

MARY LOUISE BROWN, R.N., M.S., former instructor in industrial nursing at the University of Pittsburgh School of Nursing, is now teaching occupational health nursing courses at Yale University's School of Nursing and the Department of Public Health, succeeding EMILY MYRTLE SMITH,† who has concluded a 2 year assignment to Yale from the U. S. Public Health Service.

FREDERICK F. CAMERON, JR.,† since 1947 health coordinator at Miami University, Oxford, Ohio, has assumed his duties as school health consultant with the New York State Committee on Tuberculosis and Public Health, State Charities Aid Association, New York City, filling a vacancy caused by the promotion of BERNARD E. HUGHES, Ed.D.,† to be secretary of the local program development of the State Committee.

A. RALPH CARLI, Ed.D., associate director since 1947 of the Laboratory of Psychological Studies, Stevens Institute of Technology, Hoboken, N. J., is now director of the Child Research Clinic, The Woods Schools, Langhorne, Pa.

JOSEPH CHIUMINATTO, formerly bacteriologist, Veterans Administration Hospital, Ft. Harrison, Mont., is now bacteriologist for the Alaska Health Department, Juneau Laboratory.

COL. PAUL M. CRAWFORD, after 33 years in the U. S. Army, has become Kentucky's new director of tuberculosis control, State Department of Health, a post vacant for 2 years. Col. Crawford has done work on TB for the Army.

GLADYS A. EMERSON, Ph.D., of the Merck Institute for Therapeutic Research, Rahway, N. J., has received the A.C.S. Garvan Medal of the American Chemical Society for 1952 for her work in the field of nutrition.

CAROLINE E. FALLS, R.N.,† retired after 19 years of service with the Community Service Society of New York, since 1949 as acting director of the Society's Nursing Program. She will make her home in Bethlehem, Conn.

PROFESSOR MANUEL JOSÉ PEREIRA FILHO is now director of the National Tuberculosis Service, Ministry of Education and Health, Brazil. Headquarters are in the capital city, Rio de Janeiro.

RUTH GRAHAM, for the past year associate in the Personnel and Training Service, National Tuberculosis Association, is now field representative, Virginia Tuberculosis Association.

FRANK P. GUIDOTTI, M.D.,† medical director of the New York Hotel Trades and Hotel Association Health Center, New York City, has been appointed assistant clinical professor of industrial medicine at New York University Post Graduate Medical School—Bellevue Medical Center.

EVERETT C. HANDORF,† formerly director of the Food and Milk Division, has been appointed director of the newly organized Bureau of Sanitary Engineering of the Shelby County (Tenn.) Health Department, at Memphis. The new bureau combines the work of previous divisions of food and milk, and of general sanitation.

GEORGE R. HISKEY, assistant chief of the Hospital Administration Division, Veterans Administration's Central Office, has been appointed assistant manager of the VA Hospital at Houston, Tex., where he will succeed L. H. GUNTER, being transferred to the VA Hospital at Memphis, Tenn., as assistant manager.

LT. COL. RAYMOND J. KARPEN * of Minneapolis, Minn., on September 25 was reappointed chief of the Sanitary Engineering Section of the Army's Medical Service Corps.

GERTRUDE KUNZ, R.N., former educational director, St. Louis Visiting Nurse Association, is now assistant nursing director for the Alaska Department of Health, with headquarters in Anchorage.

MONTE KYLE, R.N., previously with the Sacramento (Calif.) Health Department, is now public health nurse in Sitka, Alaska Health Department.

PASCAL F. LUCCHESI, M.D., M.P.H.,* since 1946 director of Philadelphia General Hospital, has been named vice-president and director of the Albert Einstein Medical Center in Philadelphia, effective January 8, 1952. The Center will consolidate the Jewish, Mt. Sinai, and Northern Liberties Hospitals.

Dr. Lucchesi, who is chairman of the Commission on Preventive Medicine and Public Health of the State Medical Society, received the annual Award of Merit of the Pennsylvania Public Health Association for his valuable efforts in behalf of public health.

STEPHEN C. F. MAHADY, M.D., for the past 3 years chief of service and director of the

Research Laboratory, Firland Sanatorium, Seattle, Wash., has been appointed hospital medical management advisor, assigned to the Bureau of Tuberculosis Hospitals, New York State Department of Hospitals, Albany.

KHARIS MAYERS, R.N.,† has succeeded FLORA WILLIAMS, R.N., as nursing consultant for the Southwest District Office, Ohio State Health Department.

PIERCE D. NELSON, M.D.,† of the Madison district office, Wisconsin State Health Department, is now director of the Tuberculosis and Heart Disease Control Divisions of the department.

M. G. NEURDENBURG, M.D., who has for years been with the Statistical Division of the Municipal Medical and Public Health Department of Amsterdam, The Netherlands, has recently been appointed medical officer of public health in The Netherlands State Public Health Department. He continues as editor in chief of The Netherlands fortnightly of social medicine.

IRENE K. ROWLAND, previously a volunteer in work in behalf of health and welfare agencies and the Parent-Teacher movement in Illinois, has been added to the public education staff of the National Society for Crippled Children and Adults, Chicago.

CHARLES SCOFIELD, M.D., has resigned as part-time commissioner of health in Struthers, Ohio, in order to accept the full-time position of Mahoning County health commissioner, succeeding S. G. PATTON, M.D.†

MORTIMER SPIEGELMAN † is president of the New York Metropolitan Chapter of the American Statistical Association. JOHN W. FERTIG, Ph.D.,* is chairman of the Biostatistics Section of the Chapter.

TRAWICK H. STUBBS, M.D.,† has resigned as dean of the University of Missouri Medical School and as director of the University Hospital and of the Missouri State Program for Physically Handicapped Children to accept appointment as director of the UAW-CIO's Health Institute, where he will also act as medical consultant for other activities of the union's Social Security Department, Detroit, Mich.

EUGENE J. THOMPSON, M.D., who has recently completed his internship at Boston City Hospital, has been appointed associate medical director of Winthrop-Stearns, Inc., in New York City.

ERNEST S. TIERKEL, D.V.M.,† assistant chief, Veterinary Public Health Services, Communicable Disease Center, Atlanta, is on a three month tour of duty in Europe, Africa, and Asia for WHO. Dr. Tierkel will consult with public health authorities on rabies research and control activities, returning to the United States early in January, 1952.

FRED S. VENABLE, until recently in charge of industrial hygiene activities of the Texas State Health Department's district office in Fort Worth, has resigned to become industrial hygiene engineer, Esso Standard Oil Co., Louisiana Division, Baton Rouge.

HERMAN E. WIRTH, M.D.,† in the New York State Health Department since 1948, has been named principal public health physician for tuberculosis control of the Department.

SAMUEL M. WISHIK, M.D., M.P.H.,* formerly director of child health, New York City Department of Health, has accepted appointment as professor of maternal and child health at the University of Pittsburgh School of Public Health. Dr. Wishik was also a pediatrician in private practice in New York City.

MAJOR ALEXANDER H. ZIMMERMAN,* recently assistant chief, Chicago Bureau of Heating, Ventilation, and Industrial Sanitation, has been assigned to the Air Surgeon's Office, HQ, U. S. Air Forces in Europe, as an industrial hygiene and sanitary engineer. He will check on USAFE water, sewage, and ventilation systems.

ARTHUR R. ZINTEK, M.D.,† has resigned as director of the Section of Preventable Diseases of the Wisconsin State Board of Health to become assistant medical director, Northwestern Mutual Life Insurance Company in Milwaukee. He has been succeeded by MILTON FEIG, M.D.,* formerly medical director of the Green Bay district.

DEATHS

HARRIET L. HARTLEY, M.D.,* retired chief, Division of Child Hygiene, Philadelphia (Pa.) Department of Health and former president of the Pennsylvania Public Health Association, on October 18 (Maternal and Child Health Section).

ANTON J. SCHRAMEL, M.D.,† deputy commissioner of health, Milwaukee, Wis., on November 17, 1950, of a heart attack (Health Officers Section).

CONFERENCES AND DATES

Coming in December, January and February:

American Association for the Advancement of Science. Convention Hall, Philadelphia, Pa. Dec. 26–31.

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* Fellow.

† Member.

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Sixteenth Year Book

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* John J. Sippy, M.D.....1945–1946
Harry S. Mustard, M.D..... 1947
Martha M. Eliot, M.D..... 1948
Charles F. Wilinsky, M.D..... 1949
Lowell J. Reed, Ph.D..... 1950
William P. Shepard, M.D..... 1951

* Deceased

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1929 Charles V. Chapin, M.D.*
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1937 No award
1938 Wade H. Frost, M.D.*
1939 Thomas Parran, M.D.
1940 Hans Zinsser, M.D.*
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1942 C.-E. A. Winslow, Dr.P.H.
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1945 No award
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1947 Reginald M. Atwater, M.D.
1948 Abel Wolman, Dr.Eng.
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Preliminary	Meeting		New York, N. Y., April 18	1872
"	"		Long Branch, N. J., September 12	1872
1st	Annual	Meeting	Cincinnati, O., May 1–3	1873
2d	"	"	New York, N. Y., November 11–14	1873
3rd	"	"	Philadelphia, Pa.	1874
4th	"	"	Baltimore, Md.	1875
5th	"	"	Boston, Mass.	1876
6th	"	"	Chicago, Ill.	1877
7th	"	"	Richmond, Va.	1878
8th	"	"	Nashville, Tenn.	1879
9th	"	"	New Orleans, La.	1880
10th	"	"	Savannah, Ga.	1881
11th	"	"	Indianapolis, Ind.	1882
12th	"	"	Detroit, Mich.	1883
13th	"	"	St. Louis, Mo.	1884
14th	"	"	Washington, D. C.	1885
15th	"	"	Toronto, Ont.	1886
16th	"	"	Memphis, Tenn.	1887
17th	"	"	Milwaukee, Wis.	1888
18th	"	"	Brooklyn, N. Y.	1889
19th	"	"	Charleston, S. C.	1890
20th	"	"	Kansas City, Mo.	1891
21st	"	"	Mexico City, Mex.	1892
22d	"	"	Chicago, Ill.	1893
23d	"	"	Montreal, Que.	1894
24th	"	"	Denver, Colo.	1895
25th	"	"	Buffalo, N. Y.	1896
26th	"	"	Philadelphia, Pa.	1897
27th	"	"	Ottawa, Ont.	1898
28th	"	"	Minneapolis, Minn.	1899
29th	"	"	Indianapolis, Ind.	1900
30th	"	"	Buffalo, N. Y.	1901
31st	"	"	New Orleans, La.	1902
32d	"	"	Washington, D. C.	1903
33d	"	"	Havana, Cuba	1904
34th	"	"	Boston, Mass.	1905
35th	"	"	Mexico City, Mex.	1906
36th	"	"	Atlantic City, N. J.	1907
37th	"	"	Winnipeg, Man.	1908
38th	"	"	Richmond, Va.	1909
39th	"	"	Milwaukee, Wis.	1910
40th	"	"	Havana, Cuba	1911
41st	"	"	Washington, D. C.	1912
42d	"	"	Colorado Springs, Colo.	1913
43d	"	"	Jacksonville, Fla.	1914
44th	"	"	Rochester, N. Y.	1915
45th	"	"	Cincinnati, O.	1916
46th	"	"	Washington, D. C.	1917
47th	"	"	Chicago, Ill.	1918
48th	"	"	New Orleans, La.	1919
49th	"	"	San Francisco, Calif.	1920
50th	"	"	New York, N. Y.	1921
51st	"	"	Cleveland, O.	1922
52d	"	"	Boston, Mass.	1923
53d	"	"	Detroit, Mich.	1924
54th	"	"	St. Louis, Mo.	1925
55th	"	"	Buffalo, N. Y.	1926
56th	"	"	Cincinnati, O.	1927

ANNUAL MEETINGS (Cont.)

57th	"	"	Chicago, Ill.	1928
58th	"	"	Minneapolis, Minn.	1929
59th	"	"	Fort Worth, Tex.*	1930
60th	"	"	Montreal, Que.	1931
61st	"	"	Washington, D. C.	1932
62d	"	"	Indianapolis, Ind.	1933
63d	"	"	Pasadena, Calif.	1934
64th	"	"	Milwaukee, Wis.	1935
65th	"	"	New Orleans, La.†	1936
66th	"	"	New York, N. Y.	1937
67th	"	"	Kansas City, Mo.	1938
68th	"	"	Pittsburgh, Pa.	1939
69th	"	"	Detroit, Mich.	1940
70th	"	"	Atlantic City, N. J.	1941
71st	"	"	St. Louis, Mo.	1942
72d	"	"	(Wartime Conference) New York, N. Y.	1943
73d	"	"	(Wartime Conference) New York, N. Y.	1944
			No Meeting	1945
74th	"	"	Cleveland, O.	1946
75th	"	"	Atlantic City, N. J.	1947
76th	"	"	Boston, Mass.	1948
77th	"	"	New York, N. Y.	1949
78th	"	"	St. Louis, Mo.	1950

* Post-Convention Meeting, Mexico City, Mex., 1930.
† Post-Convention Meeting, Havana, Cuba, 1936.

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NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Eva Dockter, State Dept. of Health, Bismarck
NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION, Christine MacKenzie, Rm. 751, 760 Market St., San Francisco
OHIO PUBLIC HEALTH ASSOCIATION, W. R. Haines, 17 Lawrence Block, Bellefontaine
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Marjorie Butler, State Dept. of Health, Oklahoma City
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, J. Clarence Funk, R.F.D. 1, Box 122, Fayetteville
PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY, Charles A. Freck, 159–29 90th Ave., Jamaica, N. Y.
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Ixia Sifontes, Box 7155, Santurce
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Carrie B. Du Priest, State Board of Health, Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Clarence E. Sherwood, M.D., 109 Center St. W., Madison
SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION, Herbert H. Cowper, M.D., 116 Temple St., Los Angeles
TENNESSEE PUBLIC HEALTH ASSOCIATION, Monroe F. Brown, M.D., State Department of Health, 420 Sixth Ave., N. Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Earle W. Sudderth, Dallas Co., Health Dept., Dallas
UTAH PUBLIC HEALTH ASSOCIATION, William R. Manning, State Capitol Bldg., Salt Lake City
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Elizabeth Massier, 2324 Pacific Ave., Tacoma
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Annette King, State Department of Health, Charleston
SOUTHERN BRANCH, A.P.H.A., L. M. Graves, M.D., 879 Madison Ave., Memphis, Tenn.
WESTERN BRANCH, A.P.H.A., Walter S. Mangold, Univ. of California, Berkeley, Calif.

Staff of the American Public Health Association

Professional and Administrative Personnel

Central Office, 1790 Broadway, New York 19, N. Y.

Reginald M. Atwater, M.D., Executive Secretary and Managing Editor, *American Journal of Public Health*
Jeanne L. Bickel, Office Manager and Accountant
Edith M. Boyd, Associate Secretary, Committee on Administrative Practice; and Committee on Professional Education
Florence A. Browne, M.D., Staff Director, Committee on Child Health
Francis B. Elder, Engineering Associate
Lawrence M. Fisher, Engineering Field Associate
Augusta Jay, Editorial Associate
Roscoe P. Kandle, M.D., Field Director
Martha Luginbuhl, Research Assistant
Elsie A. Siemer, Membership Secretary
Willimina Rayne Walsh, Associate Secretary
C.-E. A. Winslow, Dr.P.H., Editor, *American Journal of Public Health*

Merit System Service, 1790 Broadway, New York 19, N. Y.

Ruth Bolman, Assistant Psychometrician
Dorothy Deming, R.N., Consultant in Public Health Nursing
Charles B. Frasher, Field Consultant
Elaine Grimm, Psychometrician
Elizabeth Lazo, Statistician
Lillian D. Long, Ph.D., Director
Helen Wall, Office Manager

Subcommittee on the Hygiene of Housing, 321 Congress Ave., New Haven, Conn.

Eleanor Watkins, Secretary

Subcommittee on Medical Care, P. O. Box 5998, Bethesda, Md.

Nathan Kramer, Administrative Assistant
Milton I. Terris, M.D., Staff Director

Scientific Exhibit Citations — St. Louis Annual Meeting

AT the 78th Annual Meeting in St. Louis, 48 exhibitors participated in the Scientific Exhibit. The Committee on Scientific Exhibits commended all the exhibitors and felt that the exhibits were of the highest quality ever shown at an A.P.H.A. meeting.

Andie Knutson, Ph.D., Chairman of the Subcommittee on Evaluation, for the third time directed a scoring project using objective criteria developed by the committee. Members of the Public Health Education Section Subcommittee on Exhibits participated in the preliminary work of evaluation. The St. Louis Local Committee shared in assisting with the tabulation process. A summary of the detailed questionnaire and the points allowed each item follow:

1. Is it physically possible to read the exhibit from the point of observation? .. 10 points
2. Will all graphs, charts and diagrams be clearly understood by the intended audience? Has the use of statistical presentations been kept at a minimum? .. 10 points
3. Is the vocabulary and style of writing used such that the intended audience can comfortably follow and understand the exhibit? ..... 10 points
4. Does the exhibit sustain interest long enough to be read completely? .. 10 points
5. Does the exhibit impart the message that it is desired to impart? (This involved comparison with the statements of the objectives of each exhibit as given by the observers and the exhibitors) ... 25 points

6a. Does the exhibit tie in with the interests of the visitor? ..... 10 points

6b. Does the exhibit offer the visitor a chance to participate in satisfying a personal purpose? ..... 15 points

7. Has use been made of supplementary teaching aids (qualified attendant present, visual aids used, visitor-operated devices employed, literature tied in with the exhibit)? ..... 10 points

The following exhibitors were announced as having earned the highest scores:

American Dietetic Association
American Heart Association
Canadian Department of National Health and Welfare
Missouri Division of Health
National Society for the Prevention of Blindness
U. S. Public Health Service, Division of Chronic Disease

Although the A.P.H.A. exhibits are not eligible for citation, Special Mention was made of the Merit System Service exhibit whose score was in the same range as those cited.

Committee on Scientific Exhibits
FRANKLIN M. FOOTE, M.D.,
Chairman
PAUL H. BROWN, M.D.
HOMER N. CALVER
THEODORE S. DRACHMAN, M.D.
VIVIAN DRENCKHAHN
FRANCIS B. ELDER
RALPH T. FISHER
HORACE HUGHES
ANDIE L. KNUTSON, PH.D.
GRANVILLE W. LARIMORE, M.D.
S. S. LIFSON
WILLIMINA R. WALSH

CONSTITUTION AND BY-LAWS

AMERICAN PUBLIC HEALTH ASSOCIATION, Inc.

As Amended Effective November 3, 1950

CONSTITUTION

ARTICLE I NAME

The name of this Association, incorporated under the laws of Massachusetts, is the American Public Health Association.

ARTICLE II OBJECT

The object of this Association is to protect and promote public and personal health.

ARTICLE III MEMBERSHIP

Section 1. There shall be seven classes of constituents to be designated as Fellows, Honorary Fellows, Members, Sustaining Members, Life Members, Affiliated Societies, and Regional Branches.

Section 2. The right to hold office, except the office of Vice-President, or to serve as a member of the Governing Council, the Executive Board, or of a Section Council, or of a standing committee, or as the chairman of a committee of the Association or of a Section, or to vote on any amendment to the Constitution shall be limited to Fellows and to Life Members and Honorary Fellows who have been elected Fellows of the Association.

Section 3. The qualifications of the several classes of constituents, and the dues of each of them, the manner of their election, and their rights and privileges, except as specified in this Constitution, shall be established in the By-Laws.

ARTICLE IV GOVERNING COUNCIL COMPOSITION

Section 1. There shall be a Governing Council which shall consist of:

(a) The officers of the Association and the Elective Members of the Executive Board.

(b) The Chairman, Vice-Chairman, and Secretary of each Section, and the elective members of the Council of the Health Officers Section.

(c) One representative to be designated by each Affiliated Society.

(d) One representative to be designated by each Regional Branch.

(e) Thirty members of the Council, to be elected by the Fellows and members of the Association, for three year terms, one-third of whose terms shall expire each year. Such members of the Council shall be known as elective Councilors and shall be nominated and elected as provided for in the By-Laws. If an elective Councilor is elected a Section Chairman, Vice-Chairman, or Secretary, or an elective member of the Council of the Health Officers Section, or appointed the representative of an Affiliated Society, or of a Regional Branch, a Councilor to fill such vacancy shall be elected by the Governing Council. All vacancies while in office shall be filled by election for the unexpired term. After two consecutive terms, an elective Councilor shall be ineligible for reëlection to the Council during one Association year.

Section 2. The terms of all Councilors, except the representatives of Affiliated Societies and Regional Branches, shall begin immediately following the adjournment sine die of the Governing Council in existence at the time of their election and shall terminate with the adjournment sine die of the Governing Council at the annual meeting at which their respective terms expire; provided that newly elected Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

The terms of the representatives of Affiliated Societies and Regional Branches shall begin and terminate in accordance with the constitution and by-laws of their respective organizations.

Section 3. The Officers of the Association shall be the Officers of the Council.

Section 4. A Quorum of the Council shall consist of twenty Councilors.

Section 5. Meetings of the Council shall be called by the Executive Secretary at the request of the President, or at the request in writing of any twelve Councilors. In the latter case, the call to the meeting shall be issued at least twenty days in advance of the meeting and shall state the purpose for which it is called.

ARTICLE V GOVERNING COUNCIL FUNCTIONS

The functions of the Governing Council shall be:

Section 1. To establish and amend the By-Laws of the Association.

Section 2. To establish policies for the Association and for the guidance of the Executive Board and the Officers.

Section 3. To consider all resolutions proposed for approval in the name of the Associa-

tion, and to receive and act upon a report from a committee on resolutions appointed annually by the President.

Section 4. To approve all standards promulgated in the name of the Association.

Section 5. To receive at its first session at the time and place of the annual meeting of the Association, a report from the Chairman of the Executive Board in which the work, the accomplishments, and the financial status of the Association during the year preceding such annual meeting shall be reviewed and a statement made of the major activities contemplated for the ensuing year.

Section 6. To establish Sections of the Association; to combine or discontinue them when necessary; to prescribe the qualifications of the members of Section Councils and the chairmen of Section committees; to maintain coördination among Sections; and to formulate general rules governing their policies.

Section 7. To elect the Executive Board, the officers of the Association, with the exception of the Chairman of the Executive Board and the Executive Secretary, to elect Fellows, Honorary Fellows, Life Members, and Affiliated Societies, and to establish Regional Branches.

Section 8. To publish after each of its meetings an abstract of the minutes of such meeting.

ARTICLE VI OFFICERS

The officers of this Association shall be a President, a President-elect, three Vice-Presidents, an Executive Secretary, a Treasurer, and the Chairman of the Executive Board. The officers, with the exception of the Chairman of the Executive Board and the Executive Secretary, shall be elected by written ballot of the Governing Council as provided in this article and in the By-Laws. The President-elect shall serve as such from the close of the annual meeting at which he was elected to the close of the next annual meeting, when he shall automatically become President. As President he shall serve to the close of the next succeeding annual meeting. However, in case of the inability of the President to complete his term for any reason, the President-elect shall at once succeed to the duties of President, filling the unexpired term of his predecessor and his own term consecutively. Other officers, except the Chairman of the Executive Board and the Executive Secretary, shall serve from the close of the annual meeting when elected until the close of the next annual meeting, and all officers shall serve in any case until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained. The Chairman of the Executive Board and the Executive Secretary shall be elected by the Executive Board, which Board shall define the duties and authority of these officers, respectively.

ARTICLE VII. EXECUTIVE BOARD

Section 1. There shall be an Executive Board, consisting of the President, the President-elect, the Treasurer, and six members, to be known as the Elective Members, elected for terms of three years each by the Governing Council. The Elective Members shall be at the time of their election past or present members of the Governing Council. The terms of the Elective Members shall begin at the close of the annual meeting at which they are elected and terminate at the end of the annual meeting at the expiration of their respective terms. The terms of two Elective Members shall expire each year in rotation.

Section 2. Acceptance of membership on the Executive Board shall terminate any appointment such Fellow may hold on any of the standing committees of the Association.

Section 3. It shall be the duty of the Executive Board to direct the administrative work of the Association; to act as the Trustee of the Association's properties; to elect the Members and Sustaining Members; and in general to carry out the policies of the Governing Council between meetings of the latter.

It may designate an Assistant Treasurer whose powers shall be limited to the disbursement of funds in accordance with duly authorized budgets for the ordinary conduct of Association business. Such power shall be exercised only during a period when, in the opinion of the Board, an emergency is created due to the absence or disability of the Treasurer. Such Assistant Treasurer may be a Fellow or a corporate fiduciary institution.

In the event of a vacancy in the office of Treasurer, the Executive Board shall have power to elect a Fellow to serve as Treasurer for the unexpired term.

It shall have such further powers and duties as may be prescribed in the By-Laws.

Section 4. A Quorum of the Executive Board shall consist of five members.

ARTICLE VIII AMENDMENTS

This Constitution may be amended by the Fellows of the Association voting thereon in a ballot cast by mail, provided that the specific amendment to be acted upon is published in

the official publication of the Association not less than thirty days prior to the mailing of the ballots to the Fellows by the Administrative Office, and provided further that the amendment has received prior approval by the Governing Council. The closing date for the reception of ballots shall be forty-five days from the date of the mailing of the ballots by the Administrative Office. An amendment shall become effective only upon receiving an affirmative vote on two-thirds of the ballots cast by the Fellows. The President shall designate Tellers to canvass the ballots and to report the result to the Governing Council as provided in the By-Laws.

BY-LAWS

ARTICLE I FELLOWS

Section 1. Professional health workers who have been members of the Association for at least two years, and who are of established professional standing in the field of public health (whether employed by public or private organizations or in independent private practice) shall be eligible for election as Fellows, provided that the applicant shall have reached his thirtieth birthday at the time application for Fellowship is made and subject to the further conditions of this Article.

Section 2. The following persons shall be considered to have an established professional standing in public health for this purpose:

(a) A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine with at least one year of graduate study in public health in a university, Master of Public Health, Diploma in Public Health or other equivalent degrees, according to standards approved by the Executive Board of the American Public Health Association.

(b) A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

(c) A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

(d) A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

(e) A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs (b) and (d) that the applicant may have had shall be considered the equivalent of the same number of years' experience as a "teacher."

(f) A person not covered by the above, who has made substantial contributions to public health work in his chosen branch and who has attained a recognized professional standing.

Section 3. Every application for Fellowship shall be made on an approved form and shall be sponsored by two Fellows of the Association who shall be Fellows of the Section with which affiliation is desired, provided, however, that when affiliation with a Section is not desired, the sponsors may be any two Fellows in good standing in the Association. Fellows without Section affiliation shall be known as unaffiliated Fellows.

Section 4.

(a) When an application has been duly sponsored and otherwise completed, it shall be transmitted to the Administrative Office of the Association, which shall make note thereon of such knowledge as it may have concerning the standing of the applicant in the Association. The application shall be forwarded by the Administrative Office to the Secretary of the Section in which affiliation is desired for the action of the Section Council, and, when acted upon by the Section Council, he shall return it to the Administrative Office after he shall have endorsed thereon the action of the Section Council. When the application is for unaffiliated Fellowship, the Executive Board of the Association shall act in place of the Section Council. To be eligible for election, individuals applying for Fellowship under the provisions of subsections (a) and (b) of Section 2 of this Article shall require for approval a majority vote of the Section Council or the Executive Board. All other applicants shall require for approval a two-thirds vote of such Section Council or the Executive Board.

(b) When the application has been ap-

proved by the Section Council or the Executive Board, as above provided, it shall be voted upon by the Committee on Eligibility. Applications requiring a majority vote of the Section Council or Executive Board shall require for approval a majority vote of the Committee on Eligibility. All other applications shall require unanimous approval of the Committee on Eligibility. If approved, as above specified, and provided the name of the applicant shall have been officially published at least fifteen days in advance, the application shall be voted upon by the Governing Council, and if approved by three-fourths of the vote cast, the applicant shall be declared elected a Fellow.

Section 5.

(a) A Fellow may belong to and vote in only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the latter Section. Unaffiliated Fellows may become affiliated with a Section if approved by vote of a majority of the Council of the Section with which affiliation is desired.

(b) Fellows shall have all the rights and privileges provided for members in addition to those specifically reserved to them by the Constitution and By-Laws.

Section 6. Honorary Fellows may be elected by a three-fourths vote of the Governing Council for distinguished service in public health. Honorary Fellowship shall not confer voting power but Honorary Fellows who have previously been Fellows or members of the Association shall retain all the privileges of Fellowship or membership.

ARTICLE II MEMBERS

Section 1. Persons professionally engaged or interested in public health work shall be eligible for election as members by a three-fourths vote cast by the Executive Board when sponsored by two members or Fellows and after approval by the Committee on Eligibility. They shall be entitled to receive the official journal of the Association, to vote for elective Councilors, for the officers and members of the Council of the Section with which they are affiliated, and upon all motions and resolutions coming before such Section, to participate generally in its proceedings and to serve on committees, except as provided in the Constitution and By-Laws. A member may belong to and vote in only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the Section to which change is desired. Unaffiliated members may become affiliated with a Section if approved by vote of a majority of the Council of the Section with which affiliation is desired.

Section 2. Individuals or corporations interested in public health may be elected to Sustaining Membership by a three-fourths vote of the Executive Board. Sustaining Members shall be entitled to receive the journal and such other publications of the Association as the Executive Board may designate.

Section 3. Upon the recommendation of the Committee on Eligibility, any individual member or Fellow of the Association may be elected a member for life. The dues for Life Members shall be $200.00 payable within one year after election. Election to this grade shall not affect the privileges held by such an individual as a regularly elected member or Fellow.

ARTICLE III AFFILIATED SOCIETIES

Section 1. A state or provincial public health association or similar regional society including more or less than a state, primarily composed of professional public health workers and organized for the same general objects as the American Public Health Association, may be elected by a three-fourths vote of the Governing Council as an Affiliated Society, provided that not less than twenty of its active members and at least one-half of its active members are members or Fellows of the American Public Health Association. Not more than one such society shall be admitted from the same area.

Section 2. A society applying for affiliation shall submit a copy of its constitution and by-laws, its last annual budget, a roster of its members, and such other evidences of its qualifications as may be required. It shall submit annually and at other times such reports on its financial standing, membership, and other matters as may be required by the Executive Board of the American Public Health Association.

Section 3. The Committee on Eligibility shall consider all applications for affiliation and report its recommendations to the Governing Council.

ARTICLE IV DUES

Section 1. The following constituents shall be exempt from the payment of annual dues: Honorary Fellows, Life Members, Fellows and members who have been affiliated with the Association for thirty years or more and who have retired from active duty, and Fellows and members who have been affiliated with the Association for forty years regardless of retire-

ment. The dues of all other constituents are payable annually in advance.

Section 2. The dues for members shall be $7.00, for Fellows $12.00, and for Sustaining Members $100.00 or more.

Section 3. The dues for Affiliated Societies shall be one per cent of their gross annual income, provided that the minimum dues per society shall be $10.00 per year, and provided further that for every Fellow or member paying annual dues to the American Public Health Association, the Association shall remit to the Affiliated Society of which such person is a member the sum of $1.00 per annum.

ARTICLE V DISCONTINUANCE OF MEMBERSHIP.

Section 1. Constituents of any class whose dues are unpaid for six months or more shall be considered not in good standing. Constituents not in good standing shall not be entitled to any of the privileges or powers of membership, Fellowship, or affiliation. Good standing may be resumed upon the payment of all arrears and dues in advance for one year, provided the lapsed period is not greater than one year. The Administrative Office shall notify by registered mail all constituents who have been in arrears for a period of eleven months. The names of constituents in any class whose dues remain unpaid for one year or more and who have been duly notified as above provided shall be presented to the Executive Board which shall order the names of such constituents stricken from the membership roll. Constituents whose names have been stricken from the rolls in this manner may be again admitted in the manner provided for the election of new constituents in the class for which they make application, provided such person or organization complies with the eligibility requirements at the time the new application is made.

Section 2. If, in the opinion of the Executive Board, any member or Fellow of the Association permits the use of his name, or otherwise allows himself to be quoted or used for illustration in the advertising of a commercial product, in such a manner as to reflect discredit upon the Association, his Fellowship or membership in the Association shall thereupon be terminated.

Section 3. Upon the recommendation of the Committee on Eligibility the Governing Council may discontinue the membership, Fellowship or affiliation of any constituent. Three-fourths of the votes cast shall be necessary for such action.

ARTICLE VI PUBLICATIONS

Section 1. All publications of the Association and of its Sections shall be issued under the direction of the Executive Board.

Section 2. The American Journal of Public Health shall be the official journal of the Association. The Executive Board shall appoint a Managing Editor of the official journal and an Editorial Board of not less than five members to serve at the pleasure of the Executive Board. All papers and reports for the annual meetings are to be accepted with the understanding that they shall be the property of the Association for publication, unless this right is waived by the Managing Editor.

ARTICLE VII ELECTIVE COUNCILORS

The Elective Members of the Governing Council shall be nominated and elected according to the following procedure and schedule. The times designated for the several steps shall date from the first day of the next annual meeting as designated by the Executive Board.

Section 1. There shall be a nominating committee, to be known as the Nominating Committee for Elective Councilors, composed of one Fellow elected by each Section at the preceding annual meeting, and an additional Fellow designated by the Executive Board, the latter serving as Chairman. This Committee shall present to the Administrative Office not less than six months before the annual meeting the names of at least twenty and not more than thirty Fellows of the Association selected with due regard to geographical and membership considerations as nominees for the Governing Council.

Section 2. The Administrative Office shall publish to the membership not less than five months before the annual meeting the nominees selected by the Nominating Committee and at the same time shall announce the date on which the official ballot will be mailed to the Fellows and members.

Section 3. Upon the petition of twenty-five Fellows the Nominating Committee shall add the name of any Fellow to the nominees selected by it, provided such petition is received not less than three months before the annual meeting.

Section 4. Not less than two months previous to the annual meeting the Administrative Office shall mail to each Fellow and member entitled to vote an official ballot upon which the names of all nominees shall appear in order determined by lot. Accompanying each ballot shall be two envelopes, one marked "Ballot Envelope," into which the voter shall place his marked ballot. This envelope shall then be sealed and placed in the outer

envelope which shall bear the signature and address of the voter.

Section 5. Only ballots received not later than one month before the annual meeting shall be accepted and counted. No duplicate ballots shall be furnished to any Fellow or member.

Section 6. All ballots received prior to the closing date shall be placed in the custody of the Tellers unopened.

Section 7. The Fellows receiving the highest number of votes on a written ballot cast by the Fellows and members shall be declared elected to fill vacancies which will exist at the adjournment sine die of the Governing Council at the next annual meeting. Should two or more candidates receive the same number of votes, the Governing Council shall, when necessary, determine the order of precedence of such candidates.

Section 8. Not less than sixty days before the annual meeting the President shall appoint three Tellers from among the members of the Governing Council, one of whom shall be designated as Chairman. The Tellers shall canvass the vote on elective Councilors and on any amendment to the Constitution and shall report the result of all ballots cast to the Governing Council at its first meeting during the annual meeting.

ARTICLE VIII EXECUTIVE BOARD

Section 1. The Executive Board shall elect from its own membership a Chairman who shall serve in that capacity for such term as the Executive Board shall determine. It shall also designate such other officers of the Board as it may require for the conduct of its business.

Section 2. If a vacancy among the Elective Members of the Executive Board shall occur after the annual meeting but more than sixty days prior to the following annual meeting, the President shall designate a nominating committee from the Governing Council. Such committee shall nominate not less than three candidates for the vacancy, from among whom the candidate receiving the highest number of votes of the Governing Council in a mail ballot shall be declared elected to the Executive Board to fill the vacancy.

Section 3. In addition to those prescribed in the Constitution and in these By-Laws, the Executive Board shall have the following powers and duties:

(a) To plan methods for the procurement of funds.

(b) To approve the budgets for the Association's work.

(c) To conform to the policies of the Governing Council in the conduct of its work.

(d) To designate the chairmen of the standing committees, to appoint their members unless otherwise provided by these By-Laws. To authorize the establishment of all other Association committees and confirm the appointment of their members.

(e) To transmit a report of its proceedings and transactions to the Governing Council at least thirty days before each annual meeting.

Section 4. After two consecutive terms of three years an Elective Member of the Executive Board, except one serving as chairman, shall be ineligible for reëlection during one Association year.

ARTICLE IX NOMINATION AND ELECTION OF OFFICERS

Section 1. There shall be a committee of the Governing Council to be known as the Nominating Committee for Association Officers, composed of the President-elect of the current meeting, the Chairman of the Executive Board and three members of the Governing Council, who shall be chosen as provided in Section 8 of this Article. Such committee shall serve from the time of its election until it shall have read its report at the first regularly scheduled session of the Governing Council at the next following annual meeting. The President shall designate one of the three Elective Members as chairman.

Section 2. Not less than thirty days prior to the annual meeting of the Association such Nominating Committee shall submit to the membership of the Governing Council, either by mail or by publication in the official journal, the name or names of one or more Fellows as nominees for each of the offices of President-elect, three Vice-Presidents, and Treasurer, and for each of the vacancies among the Elective Members of the Executive Board, including those due to terms expiring at the close of that Annual Meeting.

Section 3. Upon the petition of any ten members of the Governing Council such Nominating Committee shall add to the list of candidates selected by it, the name of any eligible Fellow for the office specified in such petition; providing such petition is received by the Nominating Committee for Association Officers and found by it to be valid. The report of such Nominating Committee, including all the nominees for each of the offices, shall be presented immediately following the approval of the minutes at the first session of the Governing Council held at the annual meeting.

Section 4. The election of officers and Elective Members of the Executive Board shall be held at the last session of the Governing Coun-

cil scheduled to be held during the annual meeting.

Section 5. The officers of the Association shall be elected in the manner prescribed in the Constitution, provided, however, that whenever the number of nominees for an office or group of offices does not exceed the number of offices to be filled, the secretary may be directed to cast the ballot of the Governing Council for the nominee or nominees.

Section 6. The Elective Members of the Executive Board shall be elected by ballot, except that when there are no more than two vacancies to be filled and no more than two nominees, the nominees may be elected by acclamation. Otherwise, the two nominees receiving the highest number of the votes cast shall be declared elected for the new three year terms and the next highest in order for any unexpired terms due to vacancies which have not been filled as provided in Article VIII.

Section 7. Whenever a vote by individual ballot is required the President shall appoint three tellers who shall ascertain and report the results of the ballots cast. Whenever there is a tie between two or more candidates which makes it impossible to determine either the election or the order of precedence between them, a second ballot shall be taken limited to the candidates involved in the tie.

Section 8. Immediately following the report of the Nominating Committee at the first meeting of the Council, the Governing Council shall elect three of its members to serve on a new Nominating Committee for Association Officers for the ensuing year. No more than one such member may belong to any one Section of the Association, nor shall any of them be an officer of the Association, a member of the Executive Board or a Chairman of a Standing Committee. The election shall be by ballot from among candidates nominated from the floor. The three candidates affiliated with different sections, or unaffiliated, receiving the highest number of votes shall be declared elected. Ties shall be determined as provided in Section 7 of this Article.

ARTICLE X STANDING AND SPECIAL COMMITTEES

Section 1. There shall be four standing committees of the Association as follows:

(a) Committee on Eligibility.
(b) Committee on Administrative Practice.
(c) Committee on Research and Standards.
(d) Committee on Professional Education.

Section 2. Each standing committee shall designate from among its membership such officers as it may require for the conduct of its business and shall control its policies within the limitations prescribed by the Governing Council and the Executive Board. The Executive Secretary shall be a member, ex-officio, and serve as secretary of each standing committee.

Section 3.

(a) The Committee on Eligibility shall consist of one Fellow to be elected by each Section and an additional Fellow elected by the Executive Board who shall serve as Chairman. Members shall serve for a term of two years.

(b) This committee shall pass upon the eligibility of Fellows, members and other constituents in accordance with the provisions of the By-Laws.

Section 4.

(a) The Committee on Administrative Practice shall consist of fifteen Fellows, twelve of whom shall be designated by the Executive Board to serve for a term of four years, the terms of three members expiring each year, and three members elected by and from the Fellows affiliated with the Health Officers Section, one of whom shall be elected annually for a term of three years. Following the adoption of this amendment one member shall be elected to serve for one year, one for two years and one for three years.

(b) This committee shall engage in the collection of information regarding current public health practices and analyze the material obtained to derive standards of organization and achievement. The findings and standards may be made available to public health workers through publications, information and field service under such conditions as the committee may establish. No standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council.

Section 5.

(a) The Committee on Research and Standards shall consist of fifteen Fellows representative of the various Sections of the Association appointed by the Executive Board. Members shall serve for a term of three years, the terms of five members expiring each year.

(b) This committee shall be responsible for initiating, conducting, promoting, coördinating and reviewing research and development of standards in the technical branches of public health. This committee shall also be charged with the duty of reviewing from time to time standards already established. No standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council.

Section 6.

(a) The Committee on Professional Education shall consist of twelve Fellows appointed by the Executive Board. Members shall serve

for a term of three years, the terms of four members expiring each year.

(b) This committee shall be responsible for carrying out research and the development of standards for professional education and training in public health work and shall perform such other functions as may be delegated to the committee by the Governing Council with the view of maintaining professional qualifications of high standard. No standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council.

Section 7. Unless otherwise provided in these By-Laws, all other Association Committees shall be authorized and appointed by the Executive Board and the appointments of their members shall expire at the next annual meeting.

ARTICLE XI SECTIONS

Section 1. The Executive Board shall approve rules and regulations relating to the government of the Sections, and to the appointment of administrative committees. Each Section shall elect its own officers and shall name its respective Section committees. The right to hold office or to serve as a member of a Section Council or as chairman of a committee in a Section shall be limited to the Fellows affiliated with such Section.

Section 2.

(a) The Section Chairman, with the advice of the Section Council, shall appoint a Committee on Nominations from the Fellows affiliated with the Section at least fifteen days before each annual meeting. The Section Secretary shall be a member of such committee.

(b) The names of the members of the Committee on Nominations shall be announced at the first meeting of the Section at each annual meeting of the Association. The Committee on Nominations shall present at the second meeting of the Section a list of nominees for the Section offices, and for membership in the Section Council; provided that if the name of any Fellow be transmitted to the Nominating Committee over the signature of ten Fellows of the Section prior to the second meeting of the Section, the Nominating Committee shall add the name of such Fellow to its own list of nominees.

Section 3. The officers of each Section shall be a Chairman, a Vice-Chairman, and a Secretary, who shall be the representatives of the Section to the Governing Council of the Association, except as provided in the Constitution.

Section 4. New terms shall begin and old terms shall expire at the end of annual meetings. After five consecutive years in any elective Section office, except that of Secretary, a member shall be ineligible to reëlection to that office during one Association year.

Section 5. The Chairman, or in his absence the Vice-Chairman, shall preside at meetings of the Section.

Section 6. The Secretary shall prepare the scientific program of the Section for the annual meeting, subject to the recommendations of the Section Council, and shall submit same to the Administrative Office. He shall keep the minutes and other records of the Section, and shall transmit to the Executive Secretary of the Association a copy of the minutes of both the business and scientific sessions as soon as practicable after the close of the annual meeting of the Association. When unable to be present at meetings, he shall thoroughly instruct a substitute as far in advance of the meeting as possible.

Section 7. There shall be a Section Council composed of the three officers of the Section and five members, to be known as the elective members, each of whom shall be elected for a term of five years; provided that when a Section is first established one member shall be elected to serve for one year, one for two, one for three, one for four, and one for five years.

Section 8. The duties of the Section Council shall be:

(a) To recommend papers, and to make general recommendations in relation to the annual meeting program.

(b) To advise on Section membership and on Section policies.

(c) To submit annually to the Governing Council through the Executive Board a report of the transactions of the Section.

(d) To report annually to the Governing Council through the Executive Board on the plans, scope, and policy of the Section during the succeeding year.

(e) To formulate rules of procedure for the Section.

(f) To consider and transmit to the Governing Council resolutions originating in the Section. Only resolutions approved by the Governing Council shall be published as representing the policy of the Association.

(g) To advise on the publication of papers and reports presented at the Section meetings.

(h) To advise with respect to the appointment of technical committees, subcommittees, or Section representatives on committees of the Association.

ARTICLE XII FINANCES

All remittances to the Association shall be deposited to the account of the Treasurer. The Treasurer shall be custodian of investments of

the Association and shall disburse funds in accordance with duly authorized vouchers. With the approval of the Executive Board he may establish a drawing account for the Executive Secretary, who shall send to members of the Executive Board a financial summary of receipts and disbursements each month. Once each month, or oftener if called for, he shall also forward to the Treasurer and to the Chairman of the Executive Board an itemized statement of all expenditures. The Executive Secretary, the Treasurer and the Assistant Treasurer shall be bonded at the expense of the Association in an amount to be determined by the Executive Board. The books of the Association shall be audited annually by certified public accountants to be appointed by the Executive Board.

ARTICLE XIII MEETINGS OF THE ASSOCIATION

There shall be one general meeting of the Association, to be known as the annual meeting which shall be held each year at a place selected by the Governing Council at a time designated by the Executive Board provided, however, that the Governing Council may determine by voting at a regular meeting or by ballots cast by mail, that the annual meeting for a stated calendar year shall not be held; and provided further, that in case of great emergency the Executive Board may defer any annual meeting for not to exceed three months. Special meetings of the Association may be called by a majority vote of the Governing Council, the Executive Board, or the Association. In all proceedings of the Association, *Robert's Rules of Order* shall be official.

ARTICLE XIV AMENDMENTS

These By-Laws may be amended by a two-thirds vote of those voting on the Governing Council during the annual meeting, provided that twenty-four hours prior written notice thereof has been given. The By-Laws may further be amended by a two-thirds vote of those voting at any meeting of the Governing Council called for the purpose, provided that notice thereof shall have been given at least fifteen days prior to such meeting.

American Public Health Association

SECTION COUNCILS

1950–1951

Dental Health Section
(Organized 1943)

David B. Ast, D.D.S., *Chairman*, State Department of Health, Albany, N.Y.
Thomas W. Clune, D.M.D., *Vice-Chairman*, State Department of Health, Cranston, R.I.
Thomas L. Hagan, D.D.S., *Secretary*, U.S. Public Health Service, Washington, D.C.
Lester A. Gerlach, D.D.S. (1955)
Philip E. Blackerby, Jr., D.D.S. (1954)
Margaret H. Jeffreys (1953)
Walter J. Pelton, D.D.S. (1952)
Hugh R. McLaren, D.D.S. (1951)

Engineering Section
(Organized 1911)

George O. Pierce, *Chairman*, University of Minnesota, Minneapolis, Minn.
Ernest G. Eggert, *Vice-Chairman*, State Department of Public Health, Macon, Ga.
Dwight F. Metzler, C.E., *Secretary*, State Board of Health, Lawrence, Kans.
Walter S. Mangold (1955)
Justin M. Andrews, Sc.D. (1954)
John M. Hepler, C.E. (1953)
Morton S. Hilbert (1952)
Charles L. Senn (1951)

Epidemiology Section
(Organized 1929)

Thomas Francis, Jr., M.D., *Chairman*, University of Michigan, Ann Arbor, Mich.
Eduardo Garrido-Morales, M.D., *Vice-Chairman*, U.S. Public Health Service, Santurce, P.R.
Alexander G. Gilliam, M.D., *Secretary*, National Cancer Institute, Bethesda, Md.
W. A. Brumfield, Jr., M.D. (1955)
William McD. Hammon, M.D. (1954)
John E. Gordon, M.D. (1953)
Harold W. Brown, M.D. (1952)
Robert Dyar, M.D. (1951)

Food and Nutrition Section
(Organized 1917)

Glenn G. Slocum, Ph.D., *Chairman*, Food and Drug Administration, Washington, D.C.
Helen Stacey, *Vice-Chairman*, Children's Bureau, Washington, D.C.
Alice H. Smith, *Secretary*, State Dept. of Health, Lansing, Mich.
Harry W. von Loesecke (1955)
Frederic W. Nordsiek (1954)
Frances MacKinnon (1953)
Norman Jolliffe, M.D. (1952)
Marietta Eichelberger, Ph.D. (1951)

Health Officers Section
(Organized 1908)

Harold D. Chope, M.D., *Chairman*, City Department of Health, Redwood City, Calif.
Frank M. Hall, M.D., *Vice-Chairman*, State Board of Health, Gainesville, Fla.
John D. Porterfield, M.D., *Secretary*, State Department of Health, Columbus, Ohio
Joseph G. Molner, M.D. (1955)
Stanford F. Farnsworth, M.D. (1954)
C. Howe Eller, M.D. (1953)
Richard F. Boyd, M.D. (1952)
Carl N. Neupert, M.D. (1951)

Industrial Hygiene Section
(Organized 1914)

J. William Fehnel, *Chairman*, Metropolitan Life Insurance Company, New York, N.Y.
Frank A. Patty, *Vice-Chairman*, General Motors Corporation, Marine City, Mich.
Harry F. Schulte, *Secretary*, University of California, Los Alamos, N.M.
Lemuel McGee, M.D. (1955)
William G. Fredrick, ScD. (1954)
Carl M. Peterson, M.D. (1953)
Helmuth H. Schrenk, Ph.D. (1952)
T. Lyle Hazlett, M.D. (1951)

Laboratory Section
(Organized 1899)

Charles M. Carpenter, M.D., *Chairman*, University of California School of Medicine, Los Angeles, Calif.
John T. Tripp, Ph.D., *Vice-Chairman*, National Institutes of Health, Bethesda, Md.
Albert H. Harris, 2nd, M.D., *Secretary*, State Dept. of Health, Albany, N.Y.
Geoffrey Edsall, M.D. (1955)
Howard J. Shaughnessy, Ph.D. (1954)
Edmund K. Kline, Dr.P.H. (1953)
Sara E. Branham, M.D. (1952)
Walter L. Mallmann, Ph.D. (1951)

Maternal and Child Health Section
(Organized 1921)

Frederic M. Kriete, M.D., *Chairman,* State Department of Public Health, San Francisco, Calif.
Pauline G. Stitt, M.D., *Vice-Chairman,* Territorial Department of Health, Honolulu, Hawaii
Edward Davens, M.D., *Secretary,* State Dept. of Health, Baltimore, Md.
Goldie Corneliuson, M.D. (1955)
William M. Schmidt, M.D. (1954)
Edward R. Schlesinger, M.D. (1953)
Louis Spekter, M.D. (1952)
Francis V. Corrigan, M.D. (1951)

Medical Care Section
(Organized 1948)

James P. Dixon, Jr., M.D., *Chairman,* City and County Bureau of Health and Hospitals, Denver, Colo.
Paul B. Cornely, M.D., *Vice-Chairman,* Howard University, Washington, D.C.
Milton Terris, M.D., *Secretary,* P. O. Box 5998, Bethesda, Md.
Bernard D. Daitz (1955)
Lester Breslow, M.D. (1954)
Dean A. Clark, M.D. (1953)
Herbert L. Lombard, M.D. (1952)
Edwin F. Daily, M.D. (1951)

Public Health Education Section
(Organized 1922)

William Griffiths, Ph.D., *Chairman,* University of California, Berkeley, Calif.
Vivian V. Drenckhahn, *Vice-Chairman,* National Tuberculosis Association, New York, N.Y.
Ruth E. Grout, Ph.D., *Secretary,* University of Minnesota Medical School, Minneapolis, Minn.
Lucy S. Morgan, Ph.D. (1955)
Donald A. Dukelow, M.D. (1954)
Granville W. Larimore, M.D. (1953)
Mabel E. Rugen, Ph.D. (1952)
Eunice N. Tyler, Ph.D. (1951)

Public Health Nursing Section
(Organized 1923)

Margaret L. Shetland, R.N., *Chairman,* Syracuse University College of Nursing, Syracuse, N.Y.
Janet F. Walker, *Vice-Chairman,* University of California School of Nursing, Los Angeles, Calif.
Dorothy Wilson, Ed.D., *Secretary,* Visiting Nurse Association, New Haven, Conn.
Bosse B. Randle, R.N. (1955)
Portia Irick, R.N. (1954)
Marion Ferguson, R.N. (1953)
Mary C. Connor, R.N. (1952)
Helene B. Buker, R.N. (1951)

School Health Section
(Organized 1942)

Fred V. Hein, Ph.D., *Chairman,* American Medical Association, Chicago, Ill.
Thomas E. Shaffer, M.D., *Vice-Chairman,* Ohio State University, Columbus, Ohio
Charles C. Wilson, M.D., *Secretary,* 310 Cedar Street, New Haven, Conn.
Marjorie L. Craig (1955)
Elizabeth S. Avery, Ph.D. (1954)
William L. Hughes, Ph.D. (1953)
Dorothy B. Nyswander, Ph.D. (1952)
Leona Baumgartner, M.D. (1951)

Statistics Section
(Organized 1908)

Paul M. Densen, D.Sc., *Chairman,* University of Pittsburgh, Pittsburgh, Pa.
Oswald K. Sagen, Ph.D., *Vice-Chairman,* State Department of Public Health, Springfield, Ill.
Carl L. Erhardt, *Secretary,* City Department of Health, New York, N.Y.
John W. Fertig, Ph.D. (1955)
Marjorie Bellows (1954)
Paul Parrot, M.D. (1953)
Iwao M. Moriyama, Ph.D. (1952)
Herbert H. Marks (1951)

American Public Health Association

COMMITTEES

1950–1951

THE ASSOCIATION COMMITTEE LISTS

These pages again bring to the readers the lists of Association officers and Committee members. Once again they make a goodly company representing altogether more than 150 committees and other councils, a capable and loyal group of workers.

A certain proportion of the names of those formerly carried on such lists do not appear here. They have the Association's thanks for work well done in other years and for the fine spirit in which they have recognized the fact that, for the sake of the Association and its future effectiveness, leadership must be shared and leaders constantly developed through the assumption of responsibility. Our Association is stronger today because leaders periodically have stepped aside in order that others may step forward to acquire such knowledge as they themselves have gained.

Change in leadership is an accepted policy in the Association. Such a professional society is never strong if an informed few lead many uninformed though loyal followers. A strong association is composed of leaders many of whom could at any time take their turn and lead.

As we gratefully acknowledge the debt to those who have rendered their services as they carried their responsibilities of office, we turn with hope and expectation of other achievements to the men and women who are now to lead.

Committee on Administrative Practice

Wilton L. Halverson, M.D., *Chairman*, State Department of Public Health, San Francisco, Calif. (1951)
Richard F. Boyd, M.D., *Vice-Chairman* (1953), U. S. Public Health Service, Boston, Mass.
Reginald M. Atwater, M.D., *Secretary*, 1790 Broadway, New York, N. Y.
Franklyn B. Amos, M.D. (1953) Representing the Health Officers Section
George D. W. Cameron, M.D. (1952)
Dean A. Clark, M.D. (1952)
Kenneth A. Easlick, D.D.S. (1954)
Haven Emerson, M.D. (1953)
Robert E. Fox, M.D. (1951) Representing the Health Officers Section
Vlado A. Getting, M.D. (1954)
Ira V. Hiscock, Sc.D. (1951)
Robert H. Hutcheson, M.D. (1952)
Fred W. Jackson, M.D. (1952) Representing the Health Officers Section
Marie L. Johnson, R.N. (1951)
Clarence W. Klassen (1953)
David E. Price, M.D. (1954)

Consultants:
Carl E. Buck, Dr.P.H.
Henry F. Vaughan, Dr.P.H.
C.-E.A. Winslow, Dr.P.H.

Staff
Roscoe P. Kandle, M.D., *Field Director*
Edith M. Boyd, *Associate Secretary*

Executive Committee
Wilton L. Halverson, M.D., *Chairman*, State Department of Public Health, San Francisco, Calif.
Richard F. Boyd, M.D.
Dean A. Clark, M.D.
Ira V. Hiscock, Sc.D.

Subcommittee on Accident Prevention
I. J. Brightman, M.D., *Chairman*, State Department of Health, Albany, N. Y.
Donald B. Armstrong, M.D.
W. W. Bauer, M.D.
Albert L. Chapman, M.D.
Halbert L. Dunn, M.D., Representing Statistics Section
Thomas Fansler

John E. Gordon, M.D.
Ernest Gruenberg, M.D.
Frederick S. Kent
H. E. Kleinschmidt, M.D.
Elizabeth C. Phillips, R.N.
Ernest L. Stebbins, M.D.
Paul F. Stricker

Subcommittee on Evaluation of Administrative Practices

Haven Emerson, M.D., *Chairman*, 156 East 79th Street, New York, N. Y.
Dwight M. Bissell, M.D.
Herbert R. Edwards, M.D.
Joseph H. Kinnaman, M.D.
Joseph W. Mountin, M.D.

Diphtheria

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Donald T. Fraser, M.B., D.P.H.
Martin Frobisher, Jr., Sc.D.
D. Gordon Gill, M.B., D.P.H.
G. Foard McGinnes, M.D.
Erich Seligmann, M.D.
Ernest L. Stebbins, M.D.
John T. Tripp, Ph.D.
V. K. Volk, M.D.

Endemic Goiter

O. P. Kimball, M.D., *Chairman*, Hanna Building, Cleveland, Ohio
George M. Curtis, M.D.
E. B. Hart, Ph.D.
Roy Donaldson McClure, M.D.,
B. E. Brush, M.D., *Alternate*
E. M. Nelson, Ph.D.
William H. Sebrell, Jr., M.D., *Referee*
Hazel K. Stiebeling
Harry A. Towsley, M.D.
W. G. Wilcox, Ph.D.
Russell M. Wilder, M.D.

Consultant:
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Multiple Antigens

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Pearl L. Kendrick, Sc.D.
Franklin H. Top, M.D.
Milton V. Veldee, M.D.
V. K. Volk, M.D.

Tuberculosis Control Procedures

Herbert R. Edwards, M.D., *Chairman*, New York Tuberculosis and Health Association, New York, N. Y.
Robert J. Anderson, M.D.
Mary V. Dempsey
Esmond R. Long, M.D.
James E. Perkins, M.D.
Robert E. Plunkett, M.D.
Marion W. Sheahan, R.N.
George J. Wherrett, M.D.

Supervision of Tuberculous Patients and Their Contacts

Edward X. Mikol, M.D., *Chairman*, State Department of Health, Albany, N. Y.
Otto L. Bettag, M.D.
Zella Bryant, R.N.
Margaret Dolan, R.N.
Fannie Eshleman, R.N.
John H. Fountain, M.D.
Karen E. Munch, R.N.
David Reisner, M.D.
Clarence McK. Sharp, M.D.
Jean South, R.N.

Typhoid Fever

Roy F. Feemster, M.D., *Chairman*, Room 519 State House, Boston, Mass.
Gaylord W. Anderson, M.D.
Adrian R. Foley, M.D.
A. L. Gray, M.D.
Albert V. Hardy, M.D.
Hollis S. Ingraham, M.D.
Kenneth F. Maxcy, M.D., *Referee*

Subcommittee on Local Health Units

Haven Emerson, M.D., *Chairman*, 156 East 79th Street, New York, N. Y.
Richard F. Boyd, M.D.
Leroy E. Burney, M.D.
A. J. Chesley, M.D.
Alfred L. Frechette, M.D.
D. Gordon Gill, M.B., D.P.H.
J. Roy Hege, M.D.
Robert H. Hutcheson, M.D.
Matthew R. Kinde, M.D.
Fred Mayes, M.D.
Joseph W. Mountin, M.D.
Nathan Sinai, Dr.P.H.
Bruce Underwood, M.D.

Subcommittee on Medical Care

Dean A. Clark, M.D., *Chairman*, Massachusetts General Hospital, Boston, Mass.
Edwin F. Daily, M.D.
V. L. Ellicott, M.D.
Isidore S. Falk, Ph.D.
Dora Goldstine
Fred W. Jackson, M.D.
Basil C. MacLean, M.D.
F. D. Mott, M.D.
Joseph W. Mountin, M.D.
Marian G. Randall, R.N.
Edward S. Rogers, M.D.
Nathan Sinai, Dr.P.H.
R. M. Walls, D.D.S.

Staff
Milton Terris, M.D., Staff Director, P. O. Box 5998, Bethesda, Md.
Nathan Kramer, Administrative Assistant

Joint Committee on Health and Welfare Relationships (Joint with the American Public Welfare Association)

A.P.W.A.
James P. Brindle, *Co-Chairman*, State Department of Public Welfare, Harrisburg, Pa.
Ellen C. Potter, M.D.
Lucille M. Smith
Thomas J. S. Waxter
Elizabeth Wickenden

A.P.H.A.
Dora Goldstine, *Co-Chairman*, University of Chicago, Chicago, Ill.
Dean A. Clark, M.D.
Isidore S. Falk, Ph.D.
Joseph W. Mountin, M.D.

Joint Committee on Hospital-Health Department Relationships (Joint with the American Hospital Association)
Basil C. MacLean, M.D., *Chairman*, Strong Memorial Hospital, Rochester, N. Y.

A.H.A.
Otis Anderson, M.D.
Albert G. Engelbach, M.D.
Florence King
Martin R. Steinberg, M.D.

A.P.H.A.
V. L. Ellicott, M.D.
Fred W. Jackson, M.D.
Joseph W. Mountin, M.D.

Subcommittee on the Organization of Health Services in the Federal Government
Vlado A. Getting, M.D., *Chairman*, State Commissioner of Public Health, Boston, Mass.
Leona Baumgartner, M.D.
Haven Emerson, M.D.
Ernest L. Stebbins, M.D.

Subcommittee on Public Health Nursing *
Alice F. Brackett, R.N., *Chairman*, U. S. Children's Bureau, Washington, D. C.
Ruth Fisher, R.N., *Secretary*
Jesse B. Aronson, M.D.
Mary Elizabeth Bauhan
Vesta Bowden, R.N.
Harry L. Chant, M.D.
Hazel V. Dudley, R.N.
Ernest G. Fifield
Anna Fillmore, R.N.
Clarissa Gibson, R.N.
Marie L. Johnson, R.N.
Roscoe P. Kandle, M.D.
Eleanor M. King, R.N.
Margaret C. Klem
Melvina F. Palmer, R.N.
Mary E. Parker, R.N.
Donna Pearce, R.N.
Jeanette Rosenstock, R.N.
Emilie G. Sargent, R.N.
Marion E. Shand, R.N.
Mrs. Richard K. Stevens

Subcommittee on State and Local Health Administration
Ira V. Hiscock, Sc.D., *Chairman*, Yale University School of Medicine, New Haven, Conn.
Carl E. Buck, Dr.P.H.
Martha L. Clifford, M.D.
H. B. Cottrell, M.D.
Alfred H. Fletcher
Alfred L. Frechette, M.D.
Vlado A. Getting, M.D.
Fred W. Jackson, M.D.
Marie L. Johnson, R.N.
Joseph H. Kinnaman, M.D.
Paul V. Lemkau M.D.
Joseph W. Mountin, M.D.
Robert E. Rothermel, M.D.

Consultants:
George B. Darling, Dr.P.H.
Henry F. Vaughan, Dr.P.H.

Study Committee on the Evaluation Schedule
Carl E. Buck, Dr.P.H., *Chairman*, School of Public Health, University of Michigan, Ann Arbor, Mich.
H. B. Cottrell, M.D.
Vlado A. Getting, M.D.
George T. Palmer, Dr.P.H.
John D. Porterfield, M.D.
Carolina R. Randolph
Hugh B. Robins, M.D.
Robert E. Rothermel, M.D.

Study Committee on Sanitation
H. A. Whittaker, *Chairman*, University of Minnesota, Minneapolis, Minn.
Herbert J. Dunsmore
Alfred H. Fletcher
H. A. Kroeze, C.E.

* Membership identical with that of the Committee on Nursing Administration of the National Organization for Public Health Nursing.

Erminie C. Lacey
Arthur P. Miller, C.E.
Roy J. Morton

Consultant:
William T. Ingram

Joint Study Committee on Mental Hygiene
(Joint with American Psychiatric Association)

A.P.H.A.
Joseph H. Kinnaman, M.D., *Chairman*
Nassau County Health Department, Mineola, N. Y.
Harry L. Chant, M.D.
Pearl Shalit, R.N.
Paul Stevenson, M.D.
William H. F. Warthen, M.D.

A.P.A.
Paul V. Lemkau, M.D., *Vice-Chairman*
Edward J. Humphreys, M.D.
James V. Lowry, M.D.
Howard P. Rome, M.D.
Charles G. Stogdill, M.D.
Kent A. Zimmerman, M.D.

Study Committee on Veterinary Public Health
Martin Baum, D.V.M., *Chairman*, Colorado State Department of Health, Denver, Colo.
Richard F. Boyd, M.D.
I. A. Merchant, D.V.M.
John H. O'Neill
James H. Steele, D.V.M.
Oscar Sussman, D.V.M.
F. A. Todd, D.V.M.
C. D. Van Houweling, D.V.M.

Subcommittee on Reciprocal Sanitary Milk Control
Walter D. Tiedeman, *Chairman*, University of Michigan, School of Public Health, Ann Arbor, Mich.
A. W. Fuchs, C.E.
Leland Spencer, Ph.D.
John Taylor
K. G. Weckel, Ph.D.
Paul Corash
Huntington Williams, M.D.

Committee on Eligibility

Justin M. Andrews, Sc.D., *Chairman*, Communicable Disease Center, U.S.P.H.S., Atlanta, Ga. (1951)
Reginald M. Atwater, M.D., *Secretary*, 1790 Broadway, New York, N. Y.
Irving H. Borts, M.D., Laboratory Section (1952)
Lester Breslow, M.D., Medical Care Section (1952)
Alfred H. Fletcher, Engineering Section (1952)
Lloyd Florio, M.D., Epidemiology Section (1952)
Ruth Freeman, R.N., Public Health Nursing Section (1951)
David Littlejohn, M.D., Health Officers Section (1951)
Levitte B. Mendel, Public Health Education Section (1952)
Ruth R. Puffer, Dr.P.H., Statistics Section (1951)
William H. Rumbel, D.D.S., Dental Health Section (1952)
Harold R. Sandstead, M.D., Food and Nutrition Section (1952)
John M. Saunders, M.D., Maternal and Child Health Section (1951)
George M. Wheatley, M.D., School Health Section (1951)
Harry F. Wilson, M.D., Industrial Hygiene Section (1951)

Staff
Elsie A. Siemer, *Associate Secretary*

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Medical Care Section
Franz Goldmann, M.D., *Chairman,* Harvard School of Public Health, Boston, Mass.
John M. Brumm
Melvin L. Dollar
Jay C. Ketchum
Margaret C. Klem
Dean W. Roberts, M.D.
C. Rufus Rorem, Ph. D.
Raymond M. Walls, D.D.S.

Committee on Occupational and Industrial Mortality Statistics
Robert J. Vane, *Chairman,* Metropolitan Life Insurance Co., New York, N. Y.
Hugh P. Brinton, Ph.D.
W. Thurber Fales, Sc.D.
William M. Haenszel
Ruth R. Puffer, Dr.P.H.
Robert C. Strauss

Committee on Opportunities and Functions of Statisticians
Paul M. Densen, D.Sc., *Chairman,* University of Pittsburgh School of Public Health, Pittsburgh, Pa.
Antonio Ciocco, D.Sc.
Ann Dillon
Bernard G. Greenberg, Ph.D.
Robert Reed
Howard West, Ph.D.

Committee on Sampling Techniques in Public Health Statistics
Theodore D. Woolsey, *Chairman,* U. S. Public Health Service, Washington, D. C.
William G. Cochran
Donald Mainland
Margaret P. Martin, Ph.D.
Felix E. Moore, Jr.

Representatives of the American Public Health Association to Other Organizations and Committees for 1951

Advisory Council on Medical Education
William P. Shepard, M.D.
Reginald M. Atwater, M.D., alternate

American Association for the Advancement of Science
Reginald M. Atwater, M.D.
C.-E. A. Winslow, Dr.P.H.

American Association for Health, Physical Education and Recreation
Committee on Terminology in Health Education
Ross L. Allen, Dr.P.H.
Marjorie A. C. Young
Representing the School Health Section

William W. Bolton, M.D.
William Griffiths, Ph.D.
Representing the Public Health Education Section

American Camping Association
Health and Safety Committee
Francis B. Elder

American Documentation Institute (1950–1953)
Iwao M. Moriyama, Ph.D.

American National Red Cross
National Blood Program Advisory Committee
Vlado A. Getting, M.D.

American Society of Mechanical Engineers
Air Pollution Control Committee
Arthur C. Stern

American Society for Testing Materials
Committee on Methods of Atmospheric Sampling and Analysis, D-22
John Buxcil

Committee on Soap
Carl R. Fellers, Ph.D.

American Standards Association
Building Code Correlating Committee (1950-1951)
J. Lloyd Barron, C.E.

Letter Symbols and Abbreviations for Science and Engineering
Earle B. Phelps

Safety Code for Dry Cleaning Establishments
H. H. Schrenk, Ph.D.
H. G. Dyktor, alternate

Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases
J. J. Bloomfield

Sectional Committee on Bedding and Upholstery—Subcommittee on Sterilization
F. J. Maier

Sectional Committee on Places of Outdoor Assembly
J. Lloyd Barron, C.E.

Sectional Committee on School Lighting
Leonard Greenburg, M.D.
Joel I. Connolly, alternate

Sectional Committee on the Safety Code for Exhaust Systems, Z-9
Allen D. Brandt, Sc.D.

Sectional Committee on the Safety Code for Industrial Sanitation in Manufacturing Establishments
Leonard Greenburg, M.D.
Kenneth E. Markuson, M.D., alternate

Sectional Committee on the Safety Code for the Industrial Use of X-Rays, Z-54
Merril Eisenbud

Sectional Committee on Safety in Electric and Gas Welding and Cutting Operations, Z-49
Allen D. Brandt, Sc.D.

Sectional Committee on Standards for Graphic Presentation, Z-15
Clarence J. Velz, C.E.

Ventilation Code
Earle B. Phelps

American Trudeau Society, National Tuberculosis Association, and the American Hospital Association (Joint with the A.P.H.A.)
Joseph G. Molner, M.D.

Baking Industry Sanitation Standards Committee
Abraham E. Abrahamson

Biological Stain Commission
Edmund K. Kline, Dr.P.H.

Board to Certify Non-Medical Experts in Human Nutrition
Charles G. King, Ph.D.

Children's Bureau
Committee on Maternal and Child Health and Crippled Children's Services
A. L. van Horn, M.D., (1948–1951)

Commission on Chronic Illness
Dean W. Roberts, M.D.
Edward S. Rogers, M.D.

Council on Rheumatic Fever
David D. Rutstein, M.D.
George M. Wheatley, M.D.

Inter-Agency Committee for a Uniform Plumbing Code
A. F. Dappert
M. Warren Cowles

National Bureau of Standards—Standing Committee on Insect Wire Screening CS-128-47
Robert N. Clark

National Conference for Coöperation in Health Education
Charles C. Wilson, M.D.

National Conference on Uniform Traffic Accident Statistics
Robert J. Vane

National Health Council
Granville W. Larimore, M.D.
Ernest L. Stebbins, M.D.
Dorothy Wilson, Ed.D.

National Organization for Public Health Nursing
Joint Committee on Nursing and the School Health Program
Eldred V. Thiehoff, M.D.
Representing the Health Officers Section
Bertha H. Campbell
Representing the Public Health Education Section
Mary E. Spencer, Ph.D.
Marjorie A. C. Young
Representing the School Health Section

National Research Council
Advisory Panel to the Committee on Food Protection
William J. Darby, M.D.
Food and Nutrition Board
Norman Jolliffe, M.D.

National Safety Council
National Committee on Films for Safety
Harry E. Kleinschmidt, M.D.

National Technological Civil Protection Committee
Abel Wolman, Dr.Eng.
Arthur E. Gorman, alternate

Selection Board for World Health Organization Fellowships
Leona Baumgartner, M.D. (1951–1953)

U. S. Department of Agriculture
Poultry Industry Advisory Committee
Earle G. Brown, M.D.
Ferdinand A. Korff

U. S. Public Health Service
Committee of Consultants on Critical Materials Needs
William H. F. Warthen, M.D.

Water, Sewage, and Industrial Wastes Joint Committee on Critical Materials
Blucher A. Poole, C.E.
Abel Wolman, Dr.Eng.

REPORTS OF COMMITTEES

The By-laws of the American Public Health Association provide that no standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council. Except where specifically noted to the contrary, the following reports are in the nature of progress reports from committees, most of which have had Section approval, but which have not been presented for Governing Council action, and therefore are not to be interpreted as standards approved by the American Public Health Association.

Administrative Practice*

THE Committee on Administrative Practice has completed 30 years of service! In some ways 1950 marks a transition year in which some of our projects came to an end, and we are seeking new approaches to basic problems. The committee has, however, continued to produce worth-while results along its three paths of evaluation, surveys and basic studies of administration, and methods of procedure.

As Professor Winslow pointed out in an editorial in the July *Journal*, "A remarkable record of sustained support and persistent investigation in public health administration was terminated on March 31, 1950, with the completion of the series of grants by the Commonwealth Fund of New York to the A.P.H.A. and its Committee on Administrative Practice in support of our State Studies and Evaluation Project.

"So far as Studies are concerned, the staff has conducted formal surveys in 14 states, one province, and 27 cities and counties. The reports on these surveys, the knowledge secured and organized in the course of the studies, and the principles which have evolved from committee consideration have greatly influenced public health administration in this country and Canada. Expert consultant service was provided and widely used. These studies and field services are a monument to the ability and industry of Carl E. Buck, Dr.P.H., who was Field Director of the Association during most of this period, and whose counsel was sought by health officers and communities throughout the country."

This project also permitted the development of the *Evaluation Schedule*. It is pertinent to note that about 30,000 copies of this document have been distributed since 1943.

ACCIDENT PREVENTION

At this same time today, there is being held a session on "What's Good and What's Bad About Home Accident Prevention Programs?" organized by the Subcommittee on Accident Prevention under the fine leadership of I. J. Brightman, M.D. During this year this subcommittee has continued to collect information regarding home accident prevention in local areas. An analysis of data submitted in the Accident Prevention Section of the *Evaluation Schedules* for the year 1949 points to an urgent need for training of health department staffs in the organization of home accident prevention programs.

EVALUATION OF ADMINISTRATIVE PRACTICES

Goiter Control

O. P. Kimball, M.D., Chairman of the Study Committee on Endemic Goiter, was afforded the opportunity this summer to make a special study of endemic goiter through Mexico, Central America, and South American countries, and to report to the World Health Organization at its meeting in Rio de Janeiro, thus adding to the comprehensive research he has been making in the United States for over 30 years. The incidence of goiter throughout eight states in Mexico, Dr. Kimball learned, has averaged over 25 per cent, while in Indian villages frequently 80 to 90 per cent of the inhabitants have goiter, and the incidence of deafmutism, cretinism, and feeble-mindedness is appalling. In many

* Report of the Chairman of the Committee to the Governing Council for the Year 1950.

areas of Central and South America a high percentage of school children—25 to 80 per cent—have goiter. An Iodine Educational Bureau for Central and South America is being developed.

At a meeting in July, the Study Committee on Endemic Goiter decided to join forces with the Michigan Goiter Committee in an attempt to complete a resurvey of the original counties studied in Michigan to determine two points:

1. The percentage of homes now using iodized salt continuously, after a long silence by the health authorities, who in the past had put on regular campaigns of education for the use of iodized salt;

2. The percentage of goiter now found among the school children in these counties, and whether the goiters that are now found are in the homes where they have never used iodized salt, or whether the children are developing goiters even though iodized salt is being used continuously in the home.

The ultimate goal is federal legislation requiring that all table salt contain a certain amount of iodine. A splendid example of goiter legislation is the brief but effective law recently passed in Canada that "No salt be sold for food or table use unless it contains iodin in the proportion of one part of potassium-iodide to 10,000 parts of salt."

Diphtheria and Multiple Antigens

The Study Committee on Diphtheria has collected material for a study of the incidence of gravis and mitis strains and its correlation with the severity of the disease. The report of this study is being prepared by V. K. Volk, M.D.

At a meeting during this week the Study Committee on Multiple Antigens will hear a report by Dr. Volk on immunizing practices in Western Germany from information he collected on his recent assignment in that country. Papers on the following subjects will be published in the near future, giving the results of Dr. Volk's studies in Saginaw during the past year:

1. The effect of booster dose injections three years after multiple antigen immunizations
2. The significance of "antigenic cysts" in immunization
3. Scarlet fever immunization results following multiple antigen injections.

Tuberculosis Control Procedures

Under the new leadership of Herbert R. Edwards, M.D., the Study Committee on Tuberculosis Control Procedures will explore major problems in this field, such as BCG, and tuberculin testing of school children, as possible projects to be undertaken.

Typhoid Fever

The Study Committee on Typhoid Fever reports that a study is underway of case histories on typhoid carriers who have had surgery, in the hope of curing the carrier condition.

Such technical procedures are developed for use in local areas and can best be carried out by adequate full-time local health units.

LOCAL HEALTH UNITS

The Subcommittee on Local Health Units reports that, although the subcommittee itself has been relatively inactive, there have been a number of significant developments in the field of local health services.

1. The inventory of state and local health planning councils, made by the National Health Council and resulting in a directory of these councils. The interest thus spurred in local health planning should result in an increased understanding and development of local health services.

2. In Indiana, Kansas, and Missouri, multi-county health departments have been organized for the first time during the past year. Missouri is having a particularly interesting development. Local health councils made up of dues-paying citizen members constitute the official boards of health, according to a recent Health Center Act.

3. At the present time it seems that 70 per cent or more of the population of the country is in areas in which there is organized full-time health service, even though there may be shortage of personnel, either in terms of administrative health officers or other workers. More than 50 counties have been added during the past year to those with full-time health services, while the number of health departments has increased by only eight. This indicates fairly extensive consolidation of city and county services or of the services of several counties. The number of multi-county health departments is constantly increasing at the expense of city and single county health departments. Likewise, there is a slow decrease in the number of health departments serving fewer than 25,000 persons and a corresponding increase in those serving more. However, the number serving fewer than 40,000 persons is still nearly half of the total.

Six states are now organized to serve all of their people—Maryland, Delaware, North and South Carolina, Alabama, and New Mexico. A number of others—California, Florida, Kentucky, Louisiana, Michigan, Mississippi, Tennessee, and Virginia—are organized to serve 90 per cent or more of their populations. Kentucky, Tennessee, and Louisiana, however, have a large number of health officer vacancies.

PUBLIC HEALTH NURSING

Public health nursing is closely allied to this effort. You will recall that the Committee on Nursing Administration of the National Organization for Public Health Nursing is also our Subcommittee on Public Health Nursing. During 1949 and 1950 the subcommittee has conducted a study of four representative public health nursing services with joint direction by the health department and the board of directors of the voluntary agency. Immediate objectives of this study now nearing completion were:

1. To explore the methods of financing combination services
2. To evaluate nursing administration in such services
3. To study the extent and effectiveness of citizen participation in combination services
4. To study the opinions of the nurses rendering the care as to the effectiveness of the service
5. To determine the reaction of typical community representatives to generalized public health nursing program as administered through a combination service.

It is expected that the study will be ready for distribution in December, 1950.

In the past biennium the subcommittee has given consideration to the desirable placement of the nursing unit in a local or state health department. A subcommittee representing state and local directors of public health nursing services has held two meetings. In addition, N.O.P.H.N. representatives met with our Subcommittee on State and Local Health Administration to discuss questions relating to the place of the nursing unit in a state health department.

STATE AND LOCAL HEALTH ADMINISTRATION

The Subcommittee on State and Local Health Administration has again been an important focus of the committee's activities. The three year research project which studied the validity of the *Evaluation Schedule* was terminated in June. While a number of the weaknesses were identified and studied we can find satisfaction from the considerable strengths which were found. Some of the defects have been corrected and knowledge is at hand to make a very worth-while revision. The *Schedule* must be revised although funds are not yet in sight. This year more than 100 *Schedules* were sent to the A.P.H.A. for grading. The grading criteria and methods were revised on the basis of the re-

search findings. A grading summary and interpretive letter have been supplied each area submitting a *Schedule* as in previous years, and in spite of the decrease in the committee's funds. There is also correspondence throughout the year from communities seeking aid in their efforts in evaluation. An evaluation schedule patterned after ours has been produced for Spanish speaking areas by the Pan American Sanitary Bureau. Also, a volume patterned after our *Health Practice Indices* has been prepared by the Program for the Amazon Valley.

The field staff, together with the Commonwealth Fund staff, conducted a survey of Pinellas County, Fla., for the purpose of providing a training experience for the field staff of the Florida State Health Department.

The Field Director made a brief study and report in St. Louis at the request of J. Earl Smith, M.D., the Health Commissioner.

In the more specialized fields the *Sanitation Evaluation Schedule* is getting thorough study and field trial in the Research Project of the A.P.H.A. Engineering Section. By way of contrast, a Joint Committee of the American Psychiatric Association and our Committee on Administrative Practice developed a provisional schedule and guide in mental hygiene. This schedule may help the rest of us understand what is meant by a mental hygiene program in public health or a community mental hygiene program. Just to make it interesting, another study committee is exploring the role of the veterinarian in public health.

MEDICAL CARE

Another of our very active groups is the Subcommittee on Medical Care which reports the completion of a draft on "General Medical Care Programs Administered by Local Health Departments" based on a nation-wide field survey of health units engaged in administering general hospitals or general medical care programs for designated population groups.

The results of the field survey of local health departments which are housed jointly with general hospitals will be presented at a session of the Health Officers and Medical Care Sections during this week.

In recognition of the need to foster coöperative relationships between health and welfare departments, with particular reference to the provision of medical care, members of the subcommittee have been appointed to represent the Association in a Joint Committee of the American Public Health Association and the American Public Welfare Association. The Joint Committee is now engaged in the preparation of a draft statement on coördination of health and welfare department activities.

The subcommittee has established an information service on medical care research which provides a medium for the exchange of information among individuals and organizations engaged in research in this field.

The extent to which prepayment medical care plans carry on organized programs of health education for their subscribers is the subject of a questionnaire survey that has recently been undertaken by the subcommittee.

PUBLICATIONS

To a large extent I have saved the best for the last. At least it is the most tangible. This is a list of publications which have emanated from the committee's varied activities.

1. "The Local Health Department—Services and Responsibilities." You have a copy in your agenda for consideration at the second meeting of the Governing Council. A draft was published in the *Journal* in January for comment and criticism, has been back to the Committee on Administrative Practice

and is now in your hands with the committee's recommendation for adoption.

2. "The Quality of Medical Care in a National Health Program." Members of the Governing Council may have noted, perhaps with concern, references to the draft of this report which was published in the July, 1949, issue of the *Journal* and widely circulated for comment since then. This procedure has been in accordance with an established policy of the Association directing that all proposed statements, especially in controversial fields, should be published for information of the members before adoption. This proposed report has been studied by many persons, and scores of letters are on file representing individual and group opinion about it. These have been carefully collected and circulated to the members of the subcommittee which will bring to the Committee on Administrative Practice a revised draft for consideration. In the meantime, however, I should make it clear that the report is not before the Governing Council for discussion in its substantive content. Any who wish to comment on it substantively should do that in writing addressed to Dean A. Clark, M. D., the Chairman of the Subcommittee on Medical Care.

3. The fifth edition of *Health Practice Indices* covering the years 1947 and 1948 was published in the spring. *Health Practice Indices,* as you know, is a unique record of practice as recorded in the *Evaluation Schedules* sent to the A.P.H.A. It is a collection of 78 charts including pertinent comments and a key to each local health unit's performance. The fifth edition now provides useful trend data.

4. I hope you have all seen and read the colorful volume *What's the Score?* It should help many communities to do a better public health job.

5. The people in Pennsylvania themselves have reprinted the report of that state study entitled *Keystones of Public Health for Pennsylvania,* and have prepared 50,000 copies of a 15 page digest.

6. The report of the Philadelphia survey was printed earlier this year.

There are other reports in process such as a detailed statement of the elements of state health administration which will come before the committee tonight.

That strikes me as an impressive list and I believe your committee has served you well.

WILTON L. HALVERSON, M.D.,
Director, State Department of Public Health, San Francisco, Calif., *Chairman*

Eligibility*

AS of September 1, 1950, the membership of the Association stood at the all-time record of 12,415. Some 18 per cent (2,221) are Fellows; nearly 4 per cent (466) are Life Members. During the last year (preceding September 1, 1950), your Eligibility Committee approved by mail 1,503 applications for membership. Since the present Annual Meeting began, the committee members have met twice to consider for Fellowship the names of the 249 † candidates published in the September issue of the *American Journal of Public Health*. Of this total, 14 were not approved by the Section Councils, the Executive Board (voting on applications for unaffiliated Fellowship), and the Eligibility Committee. By request of the Section Councils, several of these names were placed in a suspense category pending the receipt of further information about them or clarification of eligibility policy. We unanimously recommend to the Governing Council, therefore, that the remaining 235, the names of whom have been placed before you, be elected to Fellowship in this organization.

Four persons have applied for Life Membership during the year. It is recommended that their names—which appear at the end of the list of Fellowship applicants—be added to the roster of Life Members of the American Public Health Association.

Members of the Eligibility Committee and Section Councils have from time to time voiced their dissatisfaction concerning the brief period hitherto available at Annual Meetings for examining and appraising Fellowship applications. In an effort to remedy this defect, a tentative routine was initiated this year of sending copies of application abstracts through Section Council Secretaries (on August 15, 1950) to the members of each Section Council. These members were requested to grade each applicant informally as "A"—definitely acceptable, "B"—some doubt but probably acceptable, "C"—some doubt but probably not acceptable, "D"—definitely not acceptable, or "E"—no opinion because the applicant was unknown to the reviewer. These grades were summarized and transmitted to the members of the Eligibility Committee for their individual consideration before the St. Louis meeting.

Thus, at the first assembly of the committee (October 30), it was possible for its members to spend most of their time appraising as a group the applications of persons about whom there was some doubt. This insured relatively uniform treatment and resolution of controversial cases. On the following day, each of the committee members took his applications to his own Section Council meeting to reconcile possible differences of opinion between the committee and Section Councils, and for official action by the latter. At the second meeting of the Eligibility Committee, its members reported Section Council decisions and the names were voted on by the committee. This procedure has given both groups concerned more adequate opportunity for deliberating upon the very important business of determining who shall and who shall not be recommended to the Governing Council for Fellowship in the Association. It is suggested that this routine be followed next year.

The committee also voted (this morn-

* Report of Chairman of Committee to the Governing Council, November 1, 1950.

† One application was withdrawn by request of candidate.

ing) to take under advisement the policies relating to Section affiliation of members and Fellows to prevent misunderstanding and to promote precision and uniformity in the selective procedures of the Sections.

The committee considered the changes which have taken place in the organization known as the Ohio Federation of Public Health Officials, which has now become the Ohio Public Health Association. It is recommended to the Governing Council that the latter society be considered as of this date the duly constituted Affiliated Society of the Association in Ohio. The committee also has before it a pending application of the New York State Public Health Association for Affiliated Society status.

Consideration was given to a suggestion that the sponsorship provisions for Fellowship applications be changed to require five referees, two of whom must be Fellows of the Section concerned. This matter was approved in principle by the Committee on Eligibility and forwarded for the future attention of the Committee on Constitution and By-laws.

Consideration was also given to the names of persons whose distinguished service in public health suggest their election as Honorary Fellows. It is unanimously recommended that Mrs. Mary Woodard Lasker and Dr. Frank Macfarlan Burnet be added to this exclusive group.

JUSTIN M. ANDREWS, Sc.D.
Communicable Disease Center, U. S. Public Health Service, Atlanta, Ga., *Chairman*

Professional Education*

THE year 1950 not only marks the midpoint of a very dramatic century but has already had its own share of highly significant events. In the last few months it has become impossible to divorce one's own professional and personal ambitions from the major happenings taking place in this country and in the world—much as we may wish to the contrary. It therefore appears appropriate to examine the progress and projects of a group which has as widespread an influence as the Committee on Professional Education within the framework of events which are bound to affect every country, every group, every project, and every plan.

In 1950, only five years after cessation of the hostilities of World War II, the United States had to decide to take up arms again, thus leading the effort of the United Nations to prevent another world conflict. This step was preceded by various large-scale international projects, manifesting that the American government and people, after World War II, have taken very seriously their share of responsibility of making this a better world. In the health field this concept of world-wide responsibility led to active participation in the World Health Organization, the Food and Agricultural Organization, and other international bodies within and outside the United Nations, the loan of United States experts to survey and demonstration teams, and, most recently, the implementation of the health provisions of the aid to under-privileged areas adopted by Congress, the so-called Point 4 Program. This program will involve the loan of a considerable number of high caliber health experts to areas with severe but curable health problems and very deficient resources, particularly of personnel. All of these efforts in the field of international health involve not predominantly the use of American dollars and material resources but, more importantly, the utilization of trained and experienced men and women who are selected solely on the basis of their professional background and achievements. This fact, together with the sad state of affairs of a severe and persistent shortage of trained man power in the health field in the United States, is highly significant and will be further brought out in this report.

How then do the affairs of the Committee on Professional Education during the past year relate themselves to these larger happenings and what progress can be reported?

This is the first time I have the honor to speak to you as chairman of this committee. William P. Shepard, M.D., who assumed the Chairmanship of the Committee on Professional Education in 1940, resigned because of his new honor as President-Elect of the American Public Health Association. His extraordinary record of leadership of the committee during the past ten years was given due recognition in a statement which was adopted by the Executive Board and by the Committee on Professional Education and was published in the *American Journal of Public Health* in July, 1950.

Among Dr. Shepard's greatest contributions were 13 new reports on educational qualifications on 11 occupational groups published since 1940; his interest

* Report of the Chairman of the Committee to the Governing Council, October, 1950.

and encouragement in the development of the Merit System Service; the accreditation of schools of public health and, more recently, the project for accreditation of field training areas; the establishment of the Vocational Counseling and Placement Service; and the establishment of the Board of Preventive Medicine and Public Health. Dr. Shepard also has shown untiring interest in the recruitment of public health workers, and it is hoped that in spite of all past difficulties the major project he visualized may yet become reality.

Dr. Shepard, we know, will make important use of the knowledge and experience he acquired as Chairman of the Committee on Professional Education. Not only will he be President of the American Public Health Association for the next year, but he is also an active member of the Health Resources Advisory Committee of the National Security Resources Board. One of the most important tasks of that committee in the present situation is to advise on the allocation of health personnel. Dr. Shepard's judgment will be invaluable in this task.

During the past year two members of the committee were reappointed for three year terms; namely, Hugo Muench, M.D., and Ella E. McNeil, R.N. In addition, two new members were appointed to replace Wilson G. Smillie, M.D., and Huntington Williams, M.D., who had made valuable contributions to the committee but whose terms had expired. The two new members are Edmund K. Kline, Dr.P.H., Director of Laboratories, Cattaraugus County Department of Health, and Dean F. Smiley, M.D., Secretary of the Association of American Medical Colleges.

There is a great demand for the reprints of various reports published by the Committee on Professional Education. During the past year 6,800 reprints were distributed, and the number of committee publications circulated, including *Journal* distribution, numbered 97,000. This figure does not include the vocational literature for which there is considerable demand. Unfortunately the funds for the printing of vocational literature are limited, but one new pamphlet was developed and given very wide distribution this year—the career pamphlet, *The Public Health Statistician.*

As in previous years the annual tabulation of degrees and certificates awarded during the past academic year is in preparation. The committee last year reviewed the desirability of continuing this project and was unanimous in its expression that this is a worth-while undertaking and that the material is extremely valuable in the form presented.

Because of the change in chairmanship of the committee and resultant overlapping responsibilities, the Subcommittee on Personnel Administration was reorganized and its membership at the same time enlarged. The new Chairman of the Subcommittee on Personnel Administration is John W. R. Norton, M.D., who is the State Health Officer of North Carolina.

The Subcommittee on Accreditation of Master's Degrees in Health Education other than the M.P.H. was discharged. This type of accreditation is now well established and six of the accredited schools of public health award these degrees. The Subcommittees on Educational Qualifications of Industrial Hygienists and of Dental Hygienists also have been discharged.

Several new subcommittees have been appointed to revise reports on educational qualifications which are in need of such revision. They include the Subcommittee on Education Qualifications of Public Health Dentists, under the chairmanship of Philip E. Blackerby, D.D.S., Dental Director of the W. K. Kellogg Foundation; the Subcommittee on Educational Qualifications of School

Physicians, under the chairmanship of Charles C. Wilson, M.D., Professor of Education and Public Health of Yale University; and the Subcommittee on Educational Qualifications of Public Health Engineers, under the chairmanship of B. A. Poole, Director of the Bureau of Environmental Sanitation, Indiana State Board of Health.

The Committee on Professional Education in May voted to publish four reports in proposed form in the *American Journal of Public Health* to give the readers an opportunity to submit their suggestions and criticisms. These reports which were published between June and August, 1950, and had undergone careful preparation, contain recommended Educational Qualifications of Public Health Statisticians, Public Health Laboratory Workers, and Medical Administrators of Specialized Health Activities (these represent complete revisions of the previously published reports); and Educational Qualifications of Medical Social Workers in Public Health Programs, an entirely new report which was prepared by a subcommittee jointly appointed by the Committee on Professional Education and the American Association of Medical Social Workers. The approval of these reports will be before the Governing Council on Wednesday, November 1.

The Governing Council in previous years heard preliminary reports on one of these reports, the Educational Qualifications of Medical Administrators of Specialized Health Activities. The thinking of the committee went through various phases, during which there was a varying amount of emphasis on training in a specialty as opposed to training in public health administration without emphasis on the clinical specialty. The proposed report as published reveals the committee's thinking to the effect that public health training should be the principal requirement but might be supplemented by a reasonable amount of clinical experience. This solution will make it less difficult to fill high grade administrative positions which hitherto frequently have remained unfilled or were filled with persons poorly qualified. This condition resulted because the basic clinical experience required for the position amounted to three to five years and the salaries did not correspond to these very high requirements.

A committee which has made considerable progress during the past year is the Subcommittee on Educational Qualifications of Administrative Personnel (Non-medical) in Public Health Agencies. A report recently submitted by the subcommittee to the Committee on Professional Education has now been accepted for publication in proposed form in the *American Journal of Public Health*.

The subcommittee which prepared the report is constituted of medical health officers and other public health medical administrators; persons from the field of hospital administration, medical care, and voluntary health agencies; the areas of budget and fiscal work, personnel administration, record and procedural activities; and from schools of public health and schools of public administration. Each of these persons investigated in his own field the present types and numbers of positions and the present functions of non-medical administrators; their potential role; the general views of some authorities in the field on the type of training these persons should receive; and the facilities for training now available. The recommendations of the subcommittee indicate that the need for non-medical administrative personnel is large and presumably will be an increasing one for time to come. The implications of the employment of a greater number of well trained non-medical administrators in the public health field are very important. They are closely related to the problem of allocation of health personnel in times of crisis; to

the continued discrepancy between demand and supply of medical man power even in noncritical times; the recognition that medically trained persons perform many duties not requiring medical judgment; the expansion of existing health facilities requiring more and more man power; and the fact that medical administrative positions in the public health field frequently have lacked attraction because of the many routine duties involved which did not allow the full utilization of medical skills.

Another report soon to be published in proposed form contains recommendations on Educational Qualifications of Public Health Veterinarians, and thus takes account of the increasing importance of that specialty for the public health field. Public health veterinarians have made important contributions not only to programs in this country but also to projects in the international health field.

Each of the reports on educational qualifications prepared by the committee, of which fifteen are in current use, combines the best thinking and represents hard work and conscientious deliberations by recognized authorities in each particular field. That these recommendations are built on solid ground is given full recognition by more and more agencies, individuals, and academic institutions, and there are many instances where the selection of personnel and the specifications for certain positions conform with the recommendations made by the committee. When one of the newer professional groups in the public health field wishes to establish educational requirements, this committee is generally approached for guidance and assistance. Where there are related professional agencies which might profitably coöperate in these projects, such as the nursing group and medical social work group, the committee has invariably taken advantage of their special knowledge.

The Merit System Service looks back on a highly satisfying year. The use of the written examinations prepared by the Merit System Service for the selection of workers shows a continuing increase. Between January 1 and June 30, 1950, 385 examinations were delivered to 27 states. This is in sharp contrast to the first six months of 1949 when only 87 examinations were delivered. Another evidence of the great increase in the use of this service is provided by the fact that almost one-half of the total number of examinations delivered since 1942 were delivered in the last fiscal year.

Additional examinations were used by cities and counties, licensing or registration agencies, schools of public health, schools of public health nursing or visiting nurse associations, the American Board of Preventive Medicine and Public Health, and the U.S. Public Health Service. The Service during the past year has used 66 examinations for the selection of staff officers. Recently a number of examinations were prepared for the selection of officers, particularly physicians, dentists, nurses, and sanitarians, for overseas work. Thus, the Merit System Service is helping in the selection of health personnel for international tasks as well.

At the present time, 26 states, one state crippled children's program, one county and two city health departments have contracts with the Merit System Service for the Annual Service Plan, as against 17 states and two county health departments last year at this time. The Merit System Service constantly is taking account of the many areas which are becoming part of the public health field by including new specialties in its examination program, such as industrial hygiene, hospital administration, psychiatric social work, psychiatry, and psychology.

This year the Executive Board accredited eleven schools of public health

on the basis of recommendations made by the Committee on Professional Education which is fortunate in having Professor C.-E. A. Winslow as its Consultant on Accreditation. Eleven institutions are now accredited for the M.P.H. (D.P.H. in Canada), nine schools are accredited for the Dr. P.H., and six schools are accredited for the Master's degree in public health education other than the M.P.H. (C.P.H. in Canada). The University of Pittsburgh Graduate School of Public Health was accredited for the first time for the current academic year. The committee may have to consider accreditation of a number of new institutions in the not too distant future, but it has not found it appropriate to make any formal statement regarding the desirability to establish new schools. The failure of the bill for the Federal Aid to Education to pass Congress was a real blow to the schools in their efforts to train an adequate number of health personnel for the various national and international tasks.

During the past year a well defined project on accreditation of field training areas was started by the Committee on Professional Education with the financial support of the W. K. Kellogg Foundation. The committee was fortunate in retaining Haven Emerson, M.D., as Consultant on Accreditation of Field Training Areas. The establishment of this project was preceded by a long-standing interest and by productive efforts of the Committee on Professional Education and its Subcommittee on Field Training. In 1947, the Governing Council approved the report of Field Training of Public Health Personnel. In the following year, with the expectation of the establishment of the American Board of Preventive Medicine and Public Health, standards for the accreditation of residency experience were drawn up which were subsequently adopted by the Specialty Board. Since December, 1949, representatives of the American Board of Preventive Medicine and Public Health, some of whom are also members of the Subcommittee on Field Training, have coöperated with representatives of the Council on Medical Education and Hospitals of the American Medical Association in developing criteria for accrediting residency experience for public health physicians. These conferences have been carried out on a basis of mutual understanding, and the American Medical Association has been assured that the interest of the Committee on Professional Education in accreditation of field training areas for physicians is that of a coöperating agency with the American Medical Association and the American Board of Preventive Medicine and Public Health, and that the American Public Health Association has no intention to undertake an independent approval of medical residencies. It is expected that the first list of approved residencies in public health will be published in 1951.

Because of the need for accreditation of residency experience of the American Board of Preventive Medicine and Public Health, the project on accreditation of field training areas must aim its first concern at defining the requirements for residency experience of public health physicians. However, other groups such as public health educators will be considered in due course. In April, a meeting under the auspices of the project on accreditation of field training areas was held in Ann Arbor which included representatives of all the different groups concerned with field training. The procedure in accrediting field training areas is through state health officers who have been asked for information on services and facilities available in their states. The committee feels that residency experience under the auspices of a state health department might be the most satisfactory type since the state health department for the purpose of a well rounded training program could utilize

and combine all facilities available in the state. On the other hand, residency experience limited to a local area has the disadvantage that only the facilities in that particular area are available and that local health departments frequently are unstable in terms of quality and personnel. However, in isolated instances a good local health department might be accredited in an otherwise poorly organized state. Applications have already been received from ten states. In addition, it is expected that in the future field training programs other than those in state and local health departments, such as those organized under federal agencies, voluntary health organizations, and in industrial health services, will also be investigated.

There is no doubt that the establishment of objective criteria and the actual process of accreditation of field training areas will encourage the various agencies to improve their standards of field training and will guide them in improving the quality of training. Since a period of approved residency experience is a requirement for certification under the American Board of Preventive Medicine and Public Health, those states offering approved programs will be in a better position to attract promising young men and women. This in turn will encourage other states to improve their programs to the point where they will also be given approval. Such a development would follow the general pattern observed in the accreditation program of schools of public health which has done much to improve the quality of training. It should thus raise the standards of field training and increase the number of field training opportunities. This should in turn raise the standards of performance of public health workers in the United States, of workers loaned by the United States to foreign countries, and of workers sent to the United States by countries abroad for training purposes.

The American Board of Preventive Medicine and Public Health, which was established with the close coöperation of the Committee on Professional Education, and which uses the examinations prepared by the Merit System Service and which has asked the committee to help with standards for field training, has had many applications in its second year of operation. Since the last Annual Meeting, it has held one examination in Chicago in February and one on the West Coast in May. There are already many instances in which persons certified by the Board have been given special recognition by agencies inside and outside the public health field. To date more than 1,350 physicians have applied for certification and 859 have been certified.

The U. S. Public Health Service continues to compile studies of salaries of local and state public health workers at the request of the committee, and these studies are of great value in determining salary trends during the past few years. The 1950 study of salaries of local public health workers reveals that the increase in the past year in the median salary intervals for local health officers and sanitary engineers was $600, while for sanitarians and health educators the increase was $200, and for supervising and staff level nurses, $100. The median salary interval for laboratory workers remained the same. These studies are being carried out by the U.S. Public Health Service with the coöperation of the Subcommittee on Salary Study and the Association of State and Territorial Health Officers. Originally, the initiative came from the Subcommittee on Salary Study. There is no doubt that the salary recommendations for physicians, suggested by the subcommittee and approved by the Executive Board in 1947, did much to support the demands for salary increases made by workers in public health agencies. The subcommittee has been considering

salary recommendations for other professional groups and is desirous of bringing these various recommendations into their proper relationship. The Subcommittee on Salary Study has taken an active part in making Clearing House on Public Health Salary Information and Personnel Needs a useful section of the *American Journal of Public Health*, and some excellent objective statements have been published during the past year.

A research project originally proposed by the Subcommittee on Salary Study is now being undertaken by the Department of Public Health, the Yale University School of Medicine, with the continued interest and coöperation of the Subcommittee on Salary Study and the National Organization for Public Health Nursing, and with financial aid from the U.S. Public Health Service. The project consists of the study of state and local public health personnel and positions related to present and desirable administrative practice. It should result in a clear definition of the needs to improve administration and program planning of health services through a more efficient utilization of professional and technical public health workers. The application of the study findings should help to decrease somewhat the handicap to health services and developing health programs resulting from the persistent shortage of qualified workers. It should assist health agencies in selecting and recruiting suitably trained workers, in retaining competent workers, in planning educational and training programs, and in developing more adequate and uniform job specifications, classification systems, and recommended qualification requirements for public health workers.

This project thus relates itself to many of the problems and projects of the Committee on Professional Education, some of which were mentioned in this report. Not the least of these, which has not been touched upon as yet but around which several previous chairmen's reports centered, is that of recruitment.

Dr. Shepard in his report to the Governing Council one year ago very aptly described the seriousness of the shortage of trained personnel and outlined a recruitment project under the sponsorship of the American Public Health Association which was approved by the Association of State and Territorial Health Officers, by the Committee on Professional Education, and the Executive Board. Such an effort was in line with a resolution of the Governing Council at the 1948 Annual Meeting in which the American Public Health Association was authorized to seek sufficient funds from all available sources to plan a recruitment program and place it on a sound basis.

At the last Annual Meeting, it was hoped that on the strength of the resolution and support of the Association of State and Territorial Health Officers, the federal agencies would be able to find ways and means to withhold grants-in-aid funds for the purpose of recruitment. However, it has not been possible to find a legal basis for such withholding of funds. The American Public Health Association therefore offered contracts to the states, similar to the contracts offered by the Merit System Service under the Annual Service Plan. Mostly because of difficulties of having such funds approved by the fiscal authorities in the various states, it has not as yet been possible to launch this project for which contracts have been obtained from only four states and one territory. Four other states and one territory have indicated interest, while declinations have been received from twenty-seven states, with no response at all from eleven states. The President of the Association of State and Territorial Health Officers was notified of the state of affairs and urged to review the situation with his Executive Committee since the American Public Health Association estimates

that a minimum of fifteen states at $4,000 each per year would have to sign up in order to start the project. In the meantime, the American Public Health Association continues to do what it can with the staff already available and its basic budget, mostly within the framework of its Vocational Counseling and Placement Service and the distribution of whatever vocational literature is available.

The Vocational Counseling and Placement Service is an active service requiring regular and persistent efforts. Counseling forms an important part of the service, both by interviews and by mail. The records maintained by the Service both of available candidates and openings reveal the serious shortage of medical personnel. At the last count, there were 32 medical candidates but 245 medical openings. At the same time, there were 23 engineering candidates and 41 engineering openings.

At the outset of this report, it was pointed out that the United States has extended efforts in behalf of improvement of the international health picture as a part of the share of responsibility of the American people in making this a better world. It was also pointed out that these international health programs involve the loan of a considerable number of high caliber health experts to areas which are even more deficient in their resources of personnel than the United States. While such efforts certainly must have priority in the present world situation, the depletion of personnel resources in the United States resulting from such programs brings recruitment as a Number One priority into the foreground even more than in previous years.

LEROY E. BURNEY, M.D.,
State Board of Health,
Indianapolis, Ind.,
Chairman

Research and Standards*

"RESEARCH" all too often carries with it the sense of something recondite, cold, and passionless. It does not, to the public health practitioner, conjure up the drama of a public meeting as a result of which, by carefully prepared plans and skillfully executed leadership, a community launches a full-scale, modern public health program. Neither does it raise the vision of the harried epidemiologist fiercely struggling to solve the latest "crime club" communicable disease killer—or his hour of triumph when he uncovers the villain. The term is something that seems far removed from Joe Doaks and Jane Dakes.

Charles Kettering is reported to have said, "Research is a high hat word that scares a lot of people. It needn't. It is rather simple. Essentially it is nothing but a state of mind—a friendly welcoming attitude toward change. Going out to look for a change instead of waiting for it to come.

"Research for the practical man is an effort to do things better and not to be caught asleep at the switch. The research state of mind can apply to anything—personal affairs, or any kind of business, big or little.

"It is the problem-solving mind as contrasted with the let-well-enough-alone mind. It is the composer mind instead of the fiddler mind. It is the 'tomorrow' mind instead of the 'yesterday' mind."

And I would add the mind that tests the validity of its observations by the scientific method rather than imposing them by the voice of authority. And recognizes that change is not necessarily progress.

As I terminate these four years as chairman of the Committee on Research and Standards and six years as a member, I leave with you the definition of Dr. Kettering. I do this because the aim of the committee has been to develop among the different groups of the Association this "friendly welcoming attitude toward a state of change" and to awaken a realization that even in small health departments and in routine actions "the research state of mind can apply to anything." The committee accepts the thesis that the goal of research in public health should be to bring the fruits of public health right down to the man on the street; and to bring to the everyday problems in all branches of public health the use of scientific methods and knowledge, rather than sacrificing these scientific tools on the high altar of administrative expediency or to the Baalism of sociological double talk. The committee on several occasions has urged each of the Sections to look to its fences, to encourage each public health worker to develop that "composer" rather than to be satisfied with the "fiddler" state of mind.

And so it is a pleasure and a source of satisfaction to commence this report of the activities of the committee with a review of the work of the Subcommittee on the Hygiene of Housing. This committee, in its 13th year of active participation in research and the development of standards, can look with pride to a rounding out of the first task set for it. The list of publications of this committee—and the publications are only a poor effort to record in black and white, the thinking, study, and field work done—has been added to year by year. We reported in 1939 the publication of *Basic Principles of Healthful Housing*. This

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* Report of the Chairman to the Governing Council, October 30, 1950.

was followed in 1941 with *Housing for Health*. After a lapse of four years we told you of the first of a proposed three volume set, *An Appraisal Method for Measuring the Quality of Housing*. The next year we were also able to report publication of the second volume. This year we advise you that the set has been completed with the publication of Volume 3, *Appraisal of Neighborhood Environments*.

A companion set, *Standards for Healthful Housing*, was started in 1948 when *Planning the Neighborhood* was published. We are happy to tell you of a more recent volume in the set, *Planning the Home for Occupancy*, published this year. C.-E. A. Winslow, Dr.P.H., chairman of the subcommittee, says of this recent report, "(It) deals with the problem of space requirements—a factor fundamental to human health and comfort but shockingly violated in much recent home construction. We have, for the first time worked out the basic floor-space requirements for decent family living on the basis of essential furnishings, storage space and circulation space for ten specific functions which must be performed in the home. This report has aroused surprising interest in both the professional and lay press."

The third and last volume of this set, *Construction and Equipment of the Home*, is in the print shop now and should be in the book stalls early next year. The committee is also preparing a suggested housing code which we hope will be in final shape by this time next year. Finally, the staff secretary of the committee, Mrs. J. H. Watkins, has been making a study of the very important problem of housing for the aged and infirm. We are happy to announce that she is now in Europe on a WHO fellowship to study the notable progress which has been made in this field in England, Holland, Sweden, and Denmark.

Even with a curtailed budget the subcommittee is able to continue its high grade accomplishments, thanks to the inspiring leadership of its chairman, the generous contribution of time and energy of the committee members, and the loyalty of the two man staff (one of whom is a woman). Once again we express our thanks, also, to the Milbank Memorial Fund for its loyal financial support of the committee.

Here is an exemplification of my early comments. The work of the Subcommittee on the Hygiene of Housing is based on research, but it has not been hidden away in the dust and mustiness of a malodorous laboratory room. It is not cloaked in the vernacular of the "ivory tower." Its laboratory is the community. It is research that is having today direct bearing on the health and happiness of people all over the country. The U. S. Public Health Service has picked up the Appraisal Method and is conducting classes in Syracuse and Atlanta to train health department engineers how to use this objective measuring stick of the quality of housing—so that the benefits of this method can be carried even closer to the lives of all of us.

We are always happy to report on the progress of the public health best seller —*The Control of Communicable Diseases in Man*, prepared by the Subcommittee on Communicable Disease Control. This seventh edition, even as all six editions preceding it, was prepared by the subcommittee under the chairmanship of Haven Emerson, M.D. Here too, we find results of scientific research and study brought down to Mr. Average Citizen. There probably is no other volume in the public health field of such wide use which comprises so well the best of scientific knowledge adapted for administrative use. It becomes a treasure of concise information for all persons concerned with official public health activities. It is also used by nurses-in-training and by school teachers. Appreciable numbers find their way into the hands of the general public.

We speak again of the broad scope of participation in the preparation of this report. Although the subcommittee served as the nucleus of the preparing group, it was aided by representation from the Department of National Defense, the American Academy of Pediatrics, the Pan American Sanitary Bureau, the Ministry of Health of Great Britain, and the World Health Organization. It has been made official by the U. S. Public Health Service. It has been accepted in principle by the U. S. Army, Navy, and Air Force, and by the Ministry of Health for England and Wales, and the Department of Health for Scotland. The Pan American Sanitary Bureau has translated the volume into Spanish and is preparing a translation into Portuguese. Although we fight shy of figures in these reports, we cannot avoid expressing our amazement over the sales of this volume. Since early 1950, 92,429 volumes have been sold.

Do you feel certain that you know the current status of air sterilization? The Subcommittee on Air Sanitation is not looking from the heights of an ivory tower in evaluating for you and many others the situation in that field. As you know from previous reports, this committee was organized to provide in the Association one group that would have interests in all phases of air sanitation. Alexander D. Langmuir, M.D., and his committee consolidate those interests as is shown by the topics discussed at a session of the Annual Meeting in New York, sponsored by the subcommittee. Members of the committee have volunteered to testify as individuals in support of the efforts of the Food and Drug Administration to regulate the sale of devices for controlling air-borne infection by the use of ultra-violet irradiation or triethylene glycol. The committee also prepared a resolution calling for wider dissemination of knowledge on means for defense against biological warfare. This resolution was accepted by the Committee on Research and Standards, adopted by the Executive Board, and forwarded to the appropriate federal officials for action deemed appropriate.

The committee has several general subjects under consideration for further study. Among these is the preparation of a statement of a non-technical nature on air sanitation. The committee hopes that one of the popular magazines will publish the article. Another subject concerns the relationship of air sanitation to biological warfare.

As you know, the Association and the Illuminating Engineering Society have had a joint committee since 1947, organized for the purpose of exploring needed research in the general field of illumination. Even though budgetary restrictions limited the committee in its activities, Leonard Greenburg, M.D., Chairman of the A.P.H.A. representatives, reports some important accomplishments in 1950. The committee was able to give valuable guidance in the preparation of recommendations of illumination levels to be included in the volume, *Construction and Equipment of the Home,* being prepared by the Subcommittee on the Hygiene of Housing. Through one of its members it is preparing a semi-technical discussion of certain instruments used in determining illumination needed for various tasks under differing conditions. The joint committee is exploring the possibility of field studies to compare industrial illumination levels as recommended by the IES with conditions found under actual operations. Two groups of lady garment workers, with medical services readily available, are being considered as the subjects of the study. The studies may include certain medical investigations into the physiological effects of illumination.

Undoubtedly, the largest single activity of this committee is that of the Coördinating Committee on Laboratory Methods. CCLM, as we call it, with Friend Lee Mickle, Sc.D., as chairman,

has been consolidating all work dealing with laboratory methods that may be presented for approval by the Committee on Research and Standards and adoption by the Governing Council as an Association report. Operating under the CCLM guidance are nine separate subcommittees, each active in a specific area of laboratory methods, each important in its own right. Four of these committees already have publications well accepted in their specialty field. The oldest is the Subcommittee on Standard Methods for the Examination of Water and Sewage. F. Wellington Gilcreas is the chairman of this committee which has been working on a revision of the 9th edition of *Standard Methods for the Examination of Water and Sewage*. The 10th edition will be published jointly by the Federation of Sewage Works Associations, the American Water Works Association, and the A.P.H.A. We are unable to state with any assurance a publication date for the 10th edition, but it is unlikely that it will appear before early 1952.

Once again the A.P.H.A. has the responsibility for preparing the bacteriological methods for the new edition. Mr. Gilcreas says that present plans call for inclusion of methods for the differentiation of coliform group microörganisms and detection of "nuisance organisms" such as sulfur-reducing bacteria and slime bacteria. Nine laboratories have coöperated with the committee in studying the effects of unrefrigerated storage for 24 hours of water samples intended for bacteriological examination.

Another old-timer in the laboratory methods field is the Subcommittee on Standard Methods for the Examination of Dairy Products. A. H. Robertson, Ph.D., is the chairman. An immediate revision of *Standard Methods for the Examination of Dairy Products* is not contemplated, but the committee has been active investigating various aspects of the laboratory methods. Several studies have been carried on to determine the superiority of various culture media; investigations into phosphatase tests continue; new specifications for bacteriological transfer pipettes have been prepared and accepted by industry; some studies on new types of stains have been started; and sediment standards are being reviewed.

We remind you that the complete report, *Standard Methods for the Examination of Dairy Products,* has been broken down into two smaller volumes to meet the needs of laboratory workers who may not need the entire volume. One of these is a separate printing of the second chapter, "Microbiological Methods"; the other is an outline of the second chapter.

Both Standard Methods committees will sponsor special sessions to be held on Wednesday morning during this Annual Meeting.

The newest baby in our family of publications is the third edition of *Diagnostic Procedures and Reagents.* So new is this publication that Ralph S. Muckenfuss, M.D., chairman of the Subcommittee on Diagnostic Procedures and Reagents, reminds me that many of you have not seen it yet. The edition represents a complete revision of the previous edition with several notable additions. The colored plates illustrating the chapter on malaria parasites is a distinct improvement over the previous black and white plates. The chapters on Rh testing, leptospira infections, and antimicrobial assays, all newly covered subjects, illustrate some of the valuable changes incorporated in the 3rd edition.

The fourth publication of laboratory methods is the *Diagnostic Procedures for Virus and Rickettsial Diseases.* The Subcommittee on Virus and Rickettsial Diseases, Thomas Francis, Jr., M.D., chairman, will meet during the Annual Meeting to discuss the need for a revision of the volume. Even though the manual was published in 1948 the

changes in these procedures are so numerous and frequent that it is likely that the committee will decide that a revision is called for.

Other subcommittees are preparing their material for publication. James Gibbard, chairman of the Subcommittee on the Laboratory Examination of Shellfish, reports that his committee is working hard toward a laboratory manual that will deal with all phases of the shellfish problem. It will be more than a limited laboratory methods volume in that it will include discussion of the life history, culture, peculiarities, and other pertinent characteristics of the shellfish and the shellfish industry. Close relationships between this and the Engineering Section Committee on Shellfish is maintained to give each the advantage of plans and thinking of the other. There is no specific date in mind when publication might be expected.

The Subcommittee on the Microbiological Examination of Foods, Harry E. Goresline, Ph.D., chairman, is another committee working toward a publication. Several reports published during the past few years and dealing with specific types of foods are being used as the basis for a laboratory manual that will cover technics of examination for all foods with the exception of dairy products. Most of the chapters that will comprise the volume are ready now for consideration by the committee before submission to the Coördinating Committee on Laboratory Methods for further review. Details of publication will probably be one of the topics discussed by the Coördinating Committee during its meeting on Wednesday evening.

John F. Mahoney, M.D., chairman of the Subcommittee To Develop Reference Methods for Syphilis Serology, reports good progress for the committee. Agreement has been reached on a microflocculation test that will use an antigen composed of cardiolipin, lecithin, and cholesterol. The test will be performed on a paraffin-ringed slide similar to the present Kline test. The method has been developed to permit a quantitative measurement also.

The next task before the committee is a clinical study to determine the optimal level of reactivity for the test method. This will mean the development of an extended clinical program, an activity the committee is concentrating on now.

It is not very often that we are able to report that someone has traveled overseas as a result of membership or activity on one of the committees of R & S. This year, though, we can report two such instances. We have told you already about Mrs. Watkins's trip to Europe to study housing. The other person is Philip R. Edwards, Ph.D., who was able to represent the Association and the Subcommittee on Enteric Phage Typing at the Fifth International Congress for Microbiology in Rio de Janeiro. The trip was made possible through the coöperation of the Pan American Sanitary Bureau.

There are other exciting items in the report of the committee's activities prepared by its chairman, Pearl L. Kendrick, Sc.D. Regional centers for *S. typhosa* bacteriophage typing have been established in 14 laboratories in the United States. This means that a typing center is readily available to any part of the United States, including Hawaii and the Pacific Area. A list of the regions with the location of each typing center was published in the *Public Health Laboratory*, July, 1950, page 891. Establishment of the centers was made possible by the coöperative efforts of the Enteric Bacteriology Laboratory, Communicable Disease Center, U.S.P.H.S.; the Conference of State and Provincial Public Health Laboratories; and the Subcommittee on Enteric Phage Typing.

The committee has also been instrumental in the distribution of standard typing materials to each regional center. The original materials came from the

International Center for Enteric Phage Typing in London and were distributed through the National Center in Atlanta. Beginning in 1949, the National Center has prepared its own typing phages so that this country is no longer dependent upon foreign sources.

In July, 1950, the committee prepared and distributed a manual, *Procedure for Differentiating Bacteriophage Types of Salmonella typhosa*. The manual has been presented for study and comment.

That tells some of the more important activities of the Coördinating Committee on Laboratory Methods and its subcommittees.

A relatively new activity for this committee, but one of several years duration for the Association, is the work of the Subcommittee on Pertussis with Pearl L. Kendrick, Sc.D., chairman. This committee formerly functioned under the Committee on Administrative Practice. Having completed its studies on administrative features of pertussis immunization, it has been transferred to the Committee on Research and Standards where it is continuing research on the production of pertussis vaccines. Particular attention was given this year to determining the effect on immunization of the addition of parapertussis organisms to vaccines. The experiments were conducted on mice. The stability of pertussis vaccine has also been studied. These studies indicate that vaccine that had been in storage for 4 years did not lose any appreciable amount of its protective properties. Both liquid suspension stored in a cold room and dried material stored at room temperature were used. The protective value of individual strains of organisms was also explored.

Funds for the studies this year again were provided by 10 coöperating commercial biological manufacturers.

The Committee on Research and Standards has under way two special studies conducted by referees. One of these, the care of communicable diseases in general hospitals, has importance to all hospital planners and administrators. Alfred L. Burgdorf, M.D., the referee, has submitted one report on the subject, published in the October, 1949, *American Journal of Public Health*. Some comments have been received. An *ad hoc* committee, including representatives of national organizations interested in the subject, is being formed for the preparation of a comprehensive report.

The other study is equally important to Tom, Dick, and Harry. You have asked us to study for you the desirability of adding fluorides to drinking water as a means of preventing tooth decay. William W. Frye, M.D., with the assistance of H. Trendley Dean, D.D.S., has been our referee on the subject. The referees are not yet ready to submit a final report. Preliminary indications of evidence available point to a definite decrease in the occurrence of caries in children who have drunk water containing approximately 1 p.p.m. of fluorine. We may have a definite report on this subject next year.

In previous reports the committee has emphasized its interest in bringing together representatives of different disciplines and sections for the effective furtherance of research upon problems of common interest and its efforts to review the status of accomplishment in certain fields of active research. But, in addition, there is great need for thoughtful survey of the field of public health so as to indicate areas in which research needs more effective support and stimulation. They may be problems which have been allowed to suffer from the lack of patience required to bring them to complete fruition; those which have remained too long in the talking stage; those which have gained acceptance but for which the evidence is slight; or those for which the pattern of study has not yet clearly emerged. Your committee has, therefore, undertaken to expand its scope to consideration of research needs

of the Association as a whole, the results of which will, I hope, reveal themselves in future activities and reports. Through them the concept of scientific research as a necessary basis for development can be continuously brought to the attention of all branches of public health. There is no substitute for controlled testing of the hypothesis.

This is an era in which standards seem to shift rapidly. The standards of health and living have improved, while the gold standard has slipped. The field of public health is progressively enlarging its demands for authority into areas which reach far into the complex field of social welfare. Some consideration must be given, therefore, to the possibility that the measurement of its progress may be confused with alterations in the coefficient of expansion. In the enthusiasm over the social aspects of public health, care must be taken not to accept unreservedly conclusions drawn from uncontrolled observations, as is so commonly the case in the so-called social sciences.

I take this opportunity, then, to recommend to your attention the critical integrity and objectivity with which standards have been established throughout the history of the Committee on Research and Standards. It has been a continued education and a great privilege for me to have been permitted that association.

That, ladies and gentlemen, is a brief survey of what your Committee on Research and Standards has been doing. It represents the time and work of many willing and able persons. The activities of 17 different committees have made this accomplishment possible. Almost 200 different people have served in one capacity or another. It is a pleasure to express my appreciation of the staff of the Association for their constant help and especially to Francis B. Elder to whom much of the credit for the preparation of this report is due.

THOMAS FRANCIS, JR., M.D.
University of Michigan,
Ann Arbor, Mich., *Chairman*

Sanitation*

Committee on Administrative Practice

THE Study Committee on Sanitation was created in 1940 at the request of Dr. W. Frank Walker to "review all of the items referring to sanitation in the *Appraisal Form* and make suggestions for its improvement in this regard." The committee is a working group of the Subcommittee on State and Local Health Administration under the Committee on Administrative Practice.

The Study Committee has served to advise regarding items for evaluation since its appointment. It was the belief of the group that there was need for a detailed schedule dealing with sanitation only, and in 1947 a draft of the *Sanitation Evaluation Schedule* was completed and given field trial. In 1948, the *Schedule* was revised and made generally available for experimental use and a guide to accompany the *Schedule* was prepared.

It was the plan of the committee that no further changes would be made in this *Schedule* for at least three years, during which time the *Schedule* would be applied in selected communities, results analyzed, and the suggested methods of grading tested. It was the hope of the committee that, as a result of these analyses, the *Schedule* could be improved and released as an official document of the Committee on Administrative Practice.

After ten years of work, the Study Committee has reviewed its responsibilities which are restated here as follows:

1. Consultant to Subcommittee on State and Local Health Administration, Committee on Administrative Practice, in a continuous review of the sanitation items of the *Evaluation Schedule for Community Health Services.*
2. Develop and apply a *Sanitation Evaluation Schedule for Health Services,* and develop and apply material that will improve the *Schedule* as a measuring device for health services in environmental sanitation.

As objectives which are foreseen for the use of a *Sanitation Evaluation Schedule,* the committee visualizes the following:

1. To provide a more tangible basis for the administration and supervision of local sanitation programs, the evaluation of sanitation needs, the measurement of the effectiveness of those services in operation, and the measurement of accomplishments.
2. To accumulate sufficient data from which can be deduced reasonable estimates of the number of personnel required for various activities.
3. To stimulate the preparation of additional rating devices for specific sanitation activities.
4. To foster the development of sanitation record systems which will be more complete and will facilitate evaluation.
5. To obtain a reservoir of material to permit the establishment and revision of technical standards.
6. To show the need for and create the desire for professional workers in environmental sanitation.

The committee has been fortunate in working continuously under the leadership of Harold A. Whittaker who has served as chairman of the group since its appointment. For varying periods, the following have served as members of the committee: Herbert Dunsmore, A. H. Fletcher, Leslie Frank, William T. Ingram, H. A. Kroeze, C.E., Erminie C. Lacey, Gardner Legg, Jr., Arthur P. Miller, C.E., and Roy J. Morton. Over the years the group has had the benefit of wise counsel from Carl E. Buck.

* Progress Report of Study Committee on Sanitation, Subcommittee on State and Local Health Administration. Organized 1940.

Dr.P.H., Roscoe P. Kandle, M.D., Ira V. Hiscock, Sc.D., George T. Palmer, Dr.P.H., and W. Frank Walker, Dr.P.H.

The maximum usefulness of the *Schedule* depends upon the study and analysis of a large number of completed schedules. For this reason, it is urged that local health departments make a special effort to complete the *Sanitation Evaluation Schedule* and submit it to the American Public Health Association for study and analysis.

Agar Plate Method: Progress Report on Media Comparisons*

Committee on Research and Standards

EVER since the American Public Health Association recognized Difco's Tryptone Glucose Extract (Milk) Agar (TGEM) as the official plating medium, effective on July 1, 1939, there have been repeated complaints about particulate separation (some undissolved portions from powdered skim milk when used, but more often of the progressively flocculating masses of skim milk in the melted medium) and the mistaken colony identification of the particles. Even when the skim milk is uniformly distributed, the medium has a slightly cloudy appearance. In addition, there often was the inconvenience of locating a suitable skim milk source or of rehydrating skim milk powders and the nuisance of weighing or measuring out the quantities needed. The A.P.H.A. committee was responsible for the decision to authorize the addition of 1 per cent of skim milk to the medium. Because the Agar Plate Count was not appreciably reduced by its absence, some laboratories have deliberately omitted it from the medium.

At the Boston meeting of the A.P.H.A. in 1948, Leon Buchbinder, Ph.D., directed attention (1) to milk-free plating media with colony productivities nearly equal to that of the TGEM medium, and (2) to a realization that the magnitude of the colony counts could be adjusted slightly by small variations in the composition of a medium.

The Boston report precipitated a study in 1949 under the auspices of the International Association of Milk and Food Sanitarians (IAMFS), results of which were reported by Luther Black, Ph.D., at their 1950 Atlantic City meetings. On February 1, 1950, a summarized record of the IAMFS studies was given to Difco Laboratories, Inc., and to Baltimore Biological Laboratories, Inc., by a subcommittee including Luther A. Black, Ph.D., Leon Buchbinder, Ph.D., and A. H. Robertson, Ph.D., with C. A. Abele, Ch.E., and Samuel R. Damon, Ph.D., absent. Among the six media compared were Difco's dehydrated TGEM (used as a reference base), BBL's TGEM substitute, a simple milk-free Difco substitute, a simple BBL milk-free substitute, a complex Difco milk-free substitute, and a complex BBL milk-free substitute. Determinations on the relative productivity of the media in both this study and the former one reported by Leon Buchbinder, Ph.D., in 1948 were analyzed by Vivian Pessin, Statistician in the New York City Department of Health. Based upon averages in the 1949 comparisons, the committee could not escape the conclusion that the results obtained on the BBL TGEM substitute were practically indistinguishable from those obtained on the currently recognized Difco TGEM medium. The results on the remaining four media varied more widely from the reference standard.

Before initiating any recommendations, the committee conducted another comparison in 1950 under the auspices of our A.P.H.A. committee. The results of the plate counts so obtained from 17

*Report of the Committee on Standard Methods for the Examination of Dairy Products. Presented to the Coördinating Committee on Laboratory Methods.

collaborating laboratories confirm the observations reported above relative to the BBL TGEM substitute medium. For this reason, the committee is now recommending to the appropriate committees in the A.P.H.A. that authorization be granted for the optional use of either Difco's Tryptone Glucose Extract (Milk) Agar, Dehydrated, No. B2, as listed on pages 45–47 of their 1948 catalogue, or of BBL's Trypticase Glucose Extract (Milk) Agar, Dehydrated, No. 183, as listed on pages 76–77 of their 1950 catalogue, as standard A.P.H.A. plating media for the Agar Plate Method.

In addition to the two media identified above, the A.P.H.A. comparisons included portions of a single batch of medium, prepared in one laboratory from the separate TGEM ingredients supplied by Difco, Inc. The fourth was a Difco milk-free medium, dehydrated, the composition of which was identical to that in the IAMFS studies. The fifth was a BBL milk-free medium, the composition of which differed appreciably from that used in either of their two milk-free media in the IAMFS studies. The sixth was a synthetic medium consisting of 18 amino acids, 8 vitamins, 3 purine bases, 2 pyrimidine bases, potassium acid phosphate, magnesium sulphate, glucose, and agar, prepared under the auspices of BBL, Inc.

The introduction of a synthetic medium is aimed to establish a reproducible reference standard by which the productivities of all candidate media may be compared. It was surprising to discover that plate counts on the synthetic medium after 4 days incubation averaged essentially 95 per cent of those obtained on Difco's dehydrated TGEM agar. Earle K. Borman is now organizing some independent investigations to determine whether or not official recognition of a synthetic reference medium should be recommended. Most synthetic media previously proposed have been designed to be selective, so as to support the growth of a single (or a limited number of) bacterial species. For a milk plating medium, the objective (diametrically opposed from the "selective") is aimed to provide suitable nutrition for the growth of all species which may be found in dairy products.

The plate counts obtained in the 1950 A.P.H.A. comparisons on medium prepared in one laboratory from Difco ingredients were distinctively lower than those obtained on Difco dehydrated TGEM medium. In the interests of uniformity, the committee recommends that preference be given in the future to the use of the dehydrated product.

The average plate count, as determined by each of the two milk-free plating media used in the 1950 A.P.H.A. comparisons, was fairly close to the average count obtained on the currently recognized Difco dehydrated TGEM medium. The average count by one was slightly below, and by the other slightly above, the desired range limit to assure practically no difference in magnitude when compared with the average count on the TGEM media. Attempts are being made to modify the composition of each, so as to reduce to a negligible difference the margin between the average counts obtained on each of the milk-free media and, also, on the present TGEM medium. In order to avoid confusion among the milk industry and the control agencies, the aim of the committee has been to hold an acceptable substitute for Difco's TGEM medium to a productivity range limit not exceeding $\pm$ 5 per cent.

In the absence of a recognized tangible reference base for media productivity comparisons, Leon Buchbinder, Ph.D., has compared the productivities of 8 different batches of media prepared from lots with different factory identification numbers by one manufacturer, and 4 different batches of media from lots by another manufacturer. The results ob-

tained on one lot by one manufacturer gave productivities which were detectably different from those by other lots from the same manufacturer. Previous to this, no attempt has been made by the Association or by other interests outside of the manufacturers themselves to determine productivities on successive batches of media. The Association may wish to take appropriate steps to assure uniform productivities by different batches of media.

It had been hoped that a definite proposal on milk-free media could be made at this time, aimed now to avoid the need of recognizing in the Tenth Edition both milk-containing and milk-free media, with a limiting date beyond which use of the former would not be recognized as a standard procedure. Investigations now under way have not been completed to a stage where a satisfactory determination can be made.

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Coördinating Committee on Laboratory Methods for 1950*

Committee on Research and Standards

THIS report for the year ending in October, 1950, is the third annual report of the Coördinating Committee on Laboratory Methods (CCLM) since this committee was created at the 1947 Annual Meeting to function under the guidance of the Committee on Research and Standards. Prior to that time this committee functioned as the Coördinating Committee on Standard Methods under the Laboratory Section.

The *raison d'etre* for the committee is to perpetuate a liaison among the several committees engaged in the preparation of laboratory methods and to integrate the activities of these committees with those Sections of the Association that are concerned either with the preparation, use, or application of the public health laboratory methods fostered by the Association. The CCLM was instructed at the time of its formation that its field of activity would be primarily with laboratory methods that are the concern of more than one Section; hence, it is understood that a Section may on occasion desire to form a committee to deal with laboratory methods where the field of activity does not overlap that of other Sections.

During this year the personnel has remained unchanged and the CCLM has continued to function actively as it has done since its inception. So far as can be ascertained, there is no Section concerned in any way with laboratory methods whose members feel that the interests of the Section are not adequately represented by the committee. During 1949–1950 the CCLM held only two meetings, both of them during the New York City Annual Meeting; otherwise activities were conducted by correspondence. During the year no committees were added to the nine for which the CCLM provides guidance and no committees were disbanded. In the order of the length of time each has served the interests of the Association, the committees for whose sponsorship the CCLM functions are the following:

Committee on Standard Methods for the Examination of Water and Sewage, F. Wellington Gilcreas, *Chairman*
Committee on Standard Methods for the Examination of Dairy Products, A. H. Robertson, Ph.D., *Chairman*
Committee on Shellfish, James Gibbard, *Chairman*
Committee on Diagnostic Procedures and Reagents, Ralph S. Muckenfuss, M.D., *Chairman*
Committee on Virus and Rickettsial Diseases, Thomas Francis, Jr., M.D., *Chairman*
Committee on Diagnostic and Therapeutic Biological Products, John T. Tripp, Ph.D.
Committee on Microbiological Examination of Foods, Harry E. Goresline, Ph.D., *Chairman*
Committee to Develop Reference Methods

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* Report of the Chairman.
COÖRDINATING COMMITTEE ON STANDARD METHODS.
Organized under the Laboratory Section 1921. Established 1933.
COÖRDINATING COMMITTEE ON LABORATORY METHODS.
Organized under the Committee on Research and Standards 1947.
Published Report *Year Book* 1949–1950.

for Syphilis Serology, John F. Mahoney, M.D., *Chairman*
Committee on Enteric Phage Typing, Pearl L. Kendrick, Sc.D., *Chairman*

A summary of the activities of each committee during 1949–1950 follows:

Committee on Standard Methods for the Examination of Water and Sewage

A study has been conducted on the effect of unrefrigerated storage on the bacteriological counts of samples of water intended for bacteriological examination. The results of the study will be used in preparing recommendations for the handling of water samples prior to the time they reach the examining laboratory. Nine laboratories coöperated in the investigation which has been completed. Ralph E. Noble, a member of the committee, and a statistician are reviewing the data assembled.

The committee held a 3 day meeting in Albany during the latter part of June to review the present section on the bacteriologic examination of water in preparation of a first draft of this section for the 10th Edition of *Standard Methods for the Examination of Water and Sewage*. This draft will be the subject of discussion at a committee meeting to be held during the 1950 Annual Meeting. It is hoped that the final draft can be made available to the Joint Editorial Board about July 1, 1951.

The committee has decided to eliminate the present non-standard methods for bacteriologic examination which are given in the Appendix, and to transfer to the main text the procedures for differentiation of coliform group microorganisms. Max Levine, Ph.D., will review these technics.

It is planned to include in the bacteriologic section a section on the detection and enumeration of the so-called nuisance organisms, including the higher bacteria such as sulfur-reducing bacteria, slime bacteria, etc. Dr. H. Heukelekian of Rutgers University, consultant to the committee, will prepare a draft for consideration. Dr. Theodore A. Olson, a member of the committee, is proceeding with a review and revision of the section on the microscopic examination of water, sewage, and sewage sludge.

The committee has prepared a workshop session for the Annual Meeting. The following papers will be presented:

Is Strict Adherence to Standard Methods Feasible in All Laboratories? Paul W. Kabler.
Use of Lauryl Sulfate Tryptose Broth in the Examination of Water Samples. Joseph McCarthy.
Comparative Study on the Effect of Refrigerated and Unrefrigerated Storage on the Bacteriologic Examination of Water. Ralph E. Noble.

Committee on Standard Methods for the Examination of Dairy Products

At the Conference on Phosphatase Methods held in October, 1949, L. H. Burgwald agreed to compare the several phosphatase methods as they are applied to milk and cream. These plans were changed due to the prolonged illness of one of the collaborating researchers. Instead, a comparison of the Sanders-Sager and the Cornell methods for residual phosphatase in cheese was made. Results of the comparison will be presented at the Annual Meeting. The original plans will probably be executed in 1951.

Another referee, W. D. Tiedeman, has continued his investigations on a substitute procedure for the cumbersome hand-shaking method for determining the sterility of milk cans. Attention has been directed to applications of silicone to the interior of milk cans to determine whether it aids in reducing the accumulations of milk stone on tinned surfaces.

Progress has been made by Dr. A. H. White, of Ottawa, Canada, to determine the causes for the divergent results often obtained when plating dried milk products following the directions given in

Standard Methods. Results of his observations, using sterile water instead of sterile N/10 LiOH for the initial dilution, will be reported at the Annual Meeting.

Reference is made to last year's report of findings on a certain shipment of bacteriological transfer pipettes. Agreement on pipette specifications has been reached with the larger eastern manufacturers. Changes in the specifications, as recorded in the Ninth Edition, are of editorial nature only. The new specifications will become effective on January 1, 1951. The simple method previously outlined for determining linear conformance for each type of pipette has been used successfully at Geneva, N. Y. It is now planned to organize a formal report on that method for the guidance of those who may be interested in determining pipette conformance. Because the special equipment commonly used for determining volume conformance of these pipettes is also used for determining conformance of volume in the graduated necks of Babcock milk and cream test bottles, a separate report will be prepared describing this application.

C. K. Johns, Ph.D., will report at the Annual Meeting on some proposed changes in the method for conditioning edible gelatin for the plating method. The fact that sub-portions, taken at successive intervals while agitating a 1:9 mixture of gelatin and sterile water in a Waring Blender, gave successively lower counts as the time of operating the blender increased, has created considerable interest.

Leon Buchbinder, Ph.D., has studied the replicability of agar plate counts obtained when using media with different batch numbers but otherwise of the same composition. Heretofore, growth response on media bearing different batch identification has never been systematically studied.

Following a conference on February 1, 1950, that was held to review the summarized comparisons of counts on different plating media that were obtained in a study conducted in 1949 under the auspices of the International Association of Milk and Food Sanitarians, our Standard Methods Committee conducted a similar type of comparison in 1950. (A detailed report of this activity appears in another portion of the *Year Book* in the report of the Subcommittee on Standard Methods for the Examination of Dairy Products.)

Some confusion has resulted from trying to use sediment discs made according to the directions given in the current edition of *Standard Methods for the Examination of Dairy Products*, or certified photographs thereof, to grade sediment on retail milk supplies. One item contributing to the confusion appears to have been the relatively coarse material used in the standard sediment mixture. The standard sediment mixture now recognized has been used with reasonable success to measure sediment in milk as delivered by producers at milk receiving plants. Curtis R. Joiner will report on studies of this problem.

Reference was made last year to "Bacterial Growth Inhibitors," chiefly the newer antibiotics, which may inadvertently find their way into fluid milk and cream supplies. A trial method has been proposed for their detection and partial identification, copies of which will be furnished any investigator who wishes either to test out the method or to determine whether or not questionable supplies under his jurisdiction contain growth inhibitors in detectable amounts. Inquiry from any interested person may be addressed to the chairman of the committee.

Pressure of other duties has prevented development of a collaborative study to determine the comparative effectiveness of the recently proposed methylene blue stain formulas for use with the direct microscopic method. A basic guide for

such a study has been prepared and awaits only the availability of a suitable investigator to put it in action.

Committee on Laboratory Examination of Shellfish

This committee, under the chairmanship of James Gibbard and with the active collaboration of Cornelius B. Kelly, Jr., as secretary, has been carrying on its aims for a manual dealing with the many laboratory aspects of the shellfish problem. The manual will include sections on the biology of shellfish and their implications in disease transmission since this information has been deemed essential for any thorough examination of shellfish. Further details of plans and progress should be available by the time of the 1951 meeting.

Committee on Diagnostic Procedures and Reagents

The 3rd Edition of *Diagnostic Procedures and Reagents* has just come off the press marking the culmination of several years of activity by this committee. Chapters in the 2nd Edition have been revised extensively and three new chapters added: Leptospira Infection (Weil's Disease); Technic of Rh Testing; and Antimicrobial Assays: Bacterial Response and Level Determinations in Body Fluids. The chapter on Malaria Parasites in Man has been materially improved by the inclusion of colored plates. Time on the program of the Annual Meeting has been arranged for a panel discussion of the volume. It is hoped that this will lead to criticisms and suggestions that will result in improvements of future editions.

Charles A. Slanetz, Ph.D., Referee on Animal Care, has worked actively in preparing a report on the care of laboratory animals. This activity will develop into a formal subcommittee. No decision has yet been made whether the report should be incorporated into a future edition of *Diagnostic Procedures and Reagents* or should be published separately.

Committee on Diagnostic and Therapeutic Biological Products

This committee has continued to concern itself with both the therapeutic and diagnostic aspects of biological products in carrying out the program discussed somewhat fully in the report of the CCLM for last year. The chairman and two members of the committee have transferred to other scientific positions than those they were occupying at the beginning of the year and so have been under heavy commitments of work not conducive to extensive committee accomplishment. The chairman has kept the interests of the committee in the foreground through correspondence and personal contacts and expects that shortly the committee activities will be reactivated.

Committee on Virus and Rickettsial Diseases

During 1950 consideration has been given to the preparation of a second edition of *Diagnostic Procedures for Virus and Rickettsial Diseases*, the 347 page laboratory manual that was brought out by this committee in May, 1949. In this rapidly changing field there appears to be a need for a revision of this manual which has had extensive use in laboratories throughout the territory served by the Association and beyond. A meeting of the group of editors has been called for early in November to discuss plans for the new volume.

Committee on Microbiological Examination of Foods

During the year this committee has devoted considerable time to the revision of manuscripts prepared earlier by the referees and members of the committee to fit them into a uniform pattern of headings and subject matter. Much

progress has been made during the year toward accomplishment of the goal of the committee—preparation of a manual of laboratory methods and procedures for the microbiological examination of a comprehensive number of food products. Revised manuscripts submitted to date to the CCLM are as follows:

Examination of Cereal Products—Paul S. Prickett, referee
Examination of Dehydrated Fruits and Vegetables—Matthew Highlands, referee
Examination of Frozen Fruits, Vegetables and Precooked Frozen Foods—J. A. Berry and B. E. Proctor, referees
Examination of Meat and Meat Products—L. B. Jensen, referee
Examination of Fermented Foods—C. S. Pederson, referee
Examination of Fruit Juices and Concentrates—C. S. Pederson, referee
Examination of Spices—O. B. Williams, referee
Examination of Bottled Beverages—John Sharf, referee

The chairman of the Committee on Microbiological Examination of Foods has informed the CCLM that he expects soon to be able to submit to CCLM the final draft of this proposed manual of methods.

The final draft still requires cross-indexing of references, a chapter on media, and other finishing touches which will need time to complete. Seemingly, it will be in order for the CCLM to give consideration at the Annual Meeting to means of publishing this new volume of methods in a form that will best meet the wishes of the committee. A manual such as is proposed should tend to place the microbiological examination of food products in the field of interest of the Association on a stable analytical foundation such as the Standard Methods publications have accomplished for water and sewage and for milk and dairy products. It is surprising that the demand for this manual did not follow more closely on the heels of the other volumes. It is heartening at this time to see signs that this project will be realized in the foreseeable future. Presumably such a volume will not, in the first edition, either bear the imprint or imply that the procedures described are "Standard Methods"; rather the manual should be authorized for publication by the Committee on Research and Standards under some such designation as "Reference Methods" or "Proposed Methods" for the Microbiological Examination of Food Products. It is hoped that in 1951 this volume of methods can become a tangible reality.

Committee to Develop Reference Methods for Syphilis Serology

The technical aspects of a microflocculation test for syphilis have been agreed upon. The next task of the committee will consist of a clinical study designed to determine the optimal level of reactivity for the test method.

In general, the microflocculation test will have the following characteristics. The antigen is to be composed of a combination of cardiolipin, lecithin, and cholesterol. The test is to be performed on paraffin-ringed slides similar to the present Kline test. A quantitative feature will be an integral part of the proposed method. Serum will be delivered to three rings on the slide. The given amount of saline and antigen will be added by the needle and syringe method to each of the three rings. In this manner, undiluted serum as well as serum in dilution of 1:2 and 1:4 will be provided. The use of three serum quantities has the effect of decreasing possibility of prozone reaction. To the qualitative test, additional serum dilutions will serve as the basis for a quantitative procedure.

The reactions will be designated as "reactor" or "non-reactor." This will serve to eliminate the terms "positive," "doubtful," and "negative." All reactors will be reported by a numeral designating the highest dilution of serum which flocculates the antigen.

The second phase of the standardization program will consist of the plotting of the serology curve in a representative number of syphilis patients treated in a uniform manner. It is essential that tests be carried out on each patient at intervals of one week during the first several months following therapy. Through the use of multiple antigens set at varying levels of reactivity, it is felt that a logical solution of an optimal level of reactivity can be accomplished. The clinical phase of the study is being developed at the present time.

Committee on Enteric Phage Typing

(The report of this committee on regional centers for *S. typhosa* bacteriophage typing, standard typing materials, and uniform typing procedures is presented separately in the *Year Book*.)

Through the fortunate circumstance that Philip Edwards, Ph.D., was sent by the Pan American Sanitary Bureau on a trip to typing centers in South America, he was able to attend the International Congress of Microbiologists in Rio de Janiero during August, 1950. While there he was able to represent the committee and the National Reference Laboratory for Enteric Phage Typing at meetings of the International Committee on Enteric Phage Typing. This association with Dr. Felix and the other workers in this field should be most helpful and important in the establishment of good working relations with the International Committee.

Recent reports by committee members include:

Henderson, N. D., and Ferguson, W. W. Bacteriophage Typing of *Salmonella typhi*. *J. Lab. & Clin. Med.* 34, 6:739–743 (June), 1949.

Henderson, N. D., and Ferguson, W. W. Investigation of Bacteriophage Types D_1 and D_1HP_{80} of *Salmonella typhi* and Their Latent Bacteriophages. *Am. J. Hyg.* 50, 3:349–360 (Nov.), 1949.

Desranleau, J. M., and Martin, Irene. Bacteriophage Typing in the Province of Quebec. *Canad. J. Pub. Health* (Mar.), 1950.

Other Activities of the CCLM

In the report for last year it was reported that the CCLM had under consideration matters which as yet had not developed to the stage where special committees had been set up to develop them. One of these was concerned with antimicrobial agents, particularly disinfectants, antiseptics, germicides, and detergents. The Committee on Research and Standards had at that time taken over responsibility for the laboratory and other aspects of air sanitation, and the Laboratory Section had agreed to take appropriate action on antibiotics, both of which had been fields of activity of the former Committee on Standard Methods. Some of the members of the CCLM attended a symposium on antimicrobial agents that was held in New York in October, 1949, under the auspices of the New York Academy of Sciences that proved to be something of a clearing house for this confused area. As a result considerable push has developed for formation of a committee to begin to work in the field of those antimicrobiological agents that are in the purview of this committee. The matter will be considered during the Annual Meeting.

Another pending field of activity is the study of the care of laboratory animals. Our efforts to meet this unresolved problem have already been discussed under the report on activities of the Committee on Diagnostic Procedures and Reagents.

In closing this report the members of the CCLM feel that they can point with great pride to the continuing accomplishments during 1950 on the part of the fine groups of men and women who are serving the Association without remuneration in the preparation of methods and the solving of laboratory problems over the whole broad range of public health laboratory activities. For nearly all of the committees 1950 has been a year of great accomplishment,

as the record shows. The CCLM takes no great measure of credit for these accomplishments but rather delights to bask in reflected glory; an expression of our appreciation emanates from this report. It is earnestly hoped that in some measure the talent, energy, enthusiasm, and skill of these many individuals will be revealed to the members of the Association and others through reading this report. The chairman of the CCLM expresses his appreciation to the members of the committee who have in every instance coöperated fully in all of the undertakings of the committee. The chairman and members of CCLM are deeply indebted for the guidance and assistance received from the Secretary and Associate Secretary of the committee and from many members of their staffs. The support of our parent, the Committee on Research and Standards, and the coöperation and inspiration of the chairman of that committee is appreciated and acknowledged.

FRIEND LEE MICKLE, Sc.D., State Department of Health, Hartford, Conn., *Chairman*
REGINALD M. ATWATER, M.D., *Secretary*
ROY F. FEEMSTER, M.D.
LLOYD B. JENSEN, Ph.D.
EDMUND K. KLINE, Dr.P.H.
PEARL L. KENDRICK, Sc.D.
SEWARD E. MILLER, M.D.
RALPH S. MUCKENFUSS, M.D.
WALTER D. TIEDEMAN, C.E.
FRANCIS B. ELDER, *Associate Secretary*

Regional Centers for Phage Typing *Salmonella Typhi* Cultures*

Committee on Research and Standards

THROUGH the coördinated efforts of three agencies there have been established in the United States, regional centers for the bacteriophage typing of typhoid bacteria. The agencies are (1) The American Public Health Association through the Subcommittee on Enteric Phage Typing of the Coördinating Committee on Laboratory Methods; (2) The Communicable Disease Center, U. S. P. H. S., Enteric Bacteriology Laboratory, P. R. Edwards, Ph.D., Chief, acting as the National Typing Center; (3) Conference of State and Provincial Public Health Laboratory Directors, with A. V. Hardy, M.D., as the designated representative.

The National Typing Center and each regional center has representation on the International Committee for Enteric Phage Typing, of which Dr. A. Felix and Dr. J. Craigie are co-chairmen. Standard phages and cultures are being furnished to the National Center by Dr. Felix from the Central Enteric Reference Laboratory, London.

The laboratories which have agreed to serve as regional typing centers are listed at the end of this report, together with a recommendation as to the states to be served by each. The designated regional typing laboratories have agreed to accept cultures from the areas specified. The group of states in a given area, as approved by the subcommittee, is not to be regarded as rigidly fixed; changes may be made through individual arrangements with the typing center concerned. Otherwise it is requested that cultures for typing be directed as outlined.

The typing laboratory will report findings to the laboratory submitting cultures. Untypable strains will be sent for further study to the National Typing Center, at the Enteric Bacteriology Laboratory, Communicable Disease Center, Atlanta. To assure comparability of findings, transfers of typed strains will be submitted periodically by the regional laboratories to the National Center for check typing.

In typing cultures the regional centers will be handicapped to some degree unless other laboratories submitting cultures for typing take precautions to prevent degradation. Since most laboratories fish from original plates to a double sugar, triple sugar, or similar medium, it is suggested that those fishings which yield significant reactions be subcultured immediately upon egg medium and that the subcultures after overnight incubation be stored in a refrigerator until the organism has been identified as *Salmonella typhi*. When identification has been completed one or more egg medium cultures should be sent immediately to a regional center. In some cases, more than one subculture, each derived from a different colony, may be helpful to the center provided it is made plain that all are from a given case or carrier. A suitable egg medium is listed as culture medium No. 54, 3rd edition of *Diagnostic Procedures and Reagents* (A.P.H.A.) (No. 55b in 2nd edition). Pai's and Dorset's media are

* Report of the Subcommittee on Enteric Phage Typing to the Coördinating Committee on Laboratory Methods.

also satisfactory. Use screw-capped vials, or paraffin-treated corks to avoid excessive drying of the slants; if slants are excessively moist after preparation, dry them overnight in a 35°–37° C. incubator before sealing. Cultures should not be submitted for phage typing on media other than that recommended unless egg medium is not available; when egg medium is not available, send cultures on extract agar to avoid delay.

Epidemiologic data, directed toward obtaining an accurate idea of the distribution of phage types of *Salmonella typhi*, will be collected on an international scale through the efforts of the regional typing centers, The National Typing Center, and the International Typing Center in London. The accuracy and amount of data will be determined by the coöperation of individual laboratories submitting cultures to the regional typing centers. Whenever the following information is available, it should be supplied to the regional typing center, either at the time a culture is sent in for typing or as soon thereafter as possible:

1. Specify whether cultures were isolated from cases or carriers.
2. Indicate the source (feces, blood, bile, gall bladder).
3. If a culture was isolated from a carrier, and a previous phage typing has been carried out, please indicate the results of previous typing.
4. If the duration of the carrier state is known, please indicate.
5. Designate epidemiological relationships among the cultures, particularly the fact that cultures are from the same outbreak or that certain cases were traceable to particular carriers.
6. Cultures should be designated by the name of the person from whom isolated to prevent recording of multiple isolations from the same individual as being from different cases or carriers.

Regional Laboratories	*Area to be Served*
Dr. Gilbert Dalldorf, Director Division of Laboratories and Research New York State Department of Health New Scotland Ave., Albany, N. Y.	New York, Maine, Vermont, New Hampshire, New Jersey
Dr. Friend Lee Mickle, Director Bureau of Laboratories Connecticut State Department of Health Box 1139, Hartford, Conn.	Connecticut, Massachusetts, Rhode Island
Dr. C. J. Gentzkow, Director Bureau of Laboratories Commonwealth of Pennsylvania 34th and Locust Street Philadelphia, Pa.	Pennsylvania, Maryland, Delaware, Virginia, West Virginia
Dr. E. J. Sunkes Director of Laboratories Georgia State Department of Public Health Atlanta, Ga.	Georgia, Alabama
Dr. Philip R. Edwards Bacteriologist-in-Charge Enteric Bacteriology Laboratory Communicable Disease Center, USPHS Chamblee, Ga.	Florida, North Carolina, South Carolina, Puerto Rico, Tennessee, District of Columbia, Alaska Territorial Laboratory at Fairbanks
Dr. George H. Hauser, Director Division of Laboratories State Department of Health 546 Corondelet Street New Orleans, La.	Louisiana, Mississippi, Arkansas

Regional Laboratories (Continued)	*Areas to be Served*
Dr. G. D. Cummings, Director Division of Laboratories Michigan Department of Health Lansing, Mich.	Michigan, Ohio, Indiana, Kentucky
Dr. H. J. Shaughnessy, Chief Division of Laboratories Illinois State Department of Health 1800 Fillmore Street Chicago, Ill.	Illinois, Wisconsin, Iowa, Missouri
Dr. Henry Bauer, Assistant Chief Section of Medical Laboratories State Department of Health University Campus Minneapolis, Minn.	Minnesota, North Dakota, South Dakota, Montana
Dr. Charles A. Hunter, Director Bureau of Laboratories Kansas State Department of Health National Reserve Building Topeka, Kans.	Kansas, Oklahoma, Nebraska
Dr. J. V. Irons, Director Division of Laboratories Texas State Department of Health Austin, Tex.	Texas
Miss M. Greenfield, Director State Public Health Laboratory 305 Quivern Street Albuquerque, N. M.	New Mexico, Arizona, Colorado
Dr. M. H. Merrill, Chief Division of Laboratories State Department of Public Health 3093 Life Sciences Building Berkeley, Calif.	California, Washington, Oregon, Utah, Wyoming, Idaho, Nevada, Alaska Territorial Laboratory at Juneau
Dr. Max Levine Director of Laboratories Territory of Hawaii	Hawaiian Islands and the Pacific Area

PEARL L. KENDRICK, Sc.D., Associate Director of Laboratories, State Dept. of Health, Grand Rapids, Mich., *Chairman*
WILLIAM W. FERGUSON, Ph.D., *Secretary*
HOWARD L. BODILY, Ph.D.

EARLE K. BORMAN
EINA M. CLARK
MARION B. COLEMAN
JEAN-MARC DESRANLEAU
PHILIP R. EDWARDS, Ph.D.
ALBERT V. HARDY, M.D.
A. S. LAZARUS, Ph.D.

Current Status, at the State Level, of a Program for the Certification of Laboratories Performing Bacteriological Work on Milk*

Engineering Section

THE Committee on Milk Sanitation of the Engineering Section of the American Public Health Association has completed an investigation among the several states with reference to a proposal that laboratories performing bacteriological work on milk be certified for equipment, methods, and proficiency by an appropriate state laboratory agency. The motivation for such an investigation was the belief by this committee that such a plan would unquestionably enhance uniformity of laboratory results and promote more confidence on the part of all agencies in the results of laboratory work in the field of milk control.

Letters of inquiry were addressed to the agency having jurisdiction for milk control in each of the 48 states. Three questions were posed: First, what plan is now followed for the approval or certification of milk testing laboratories? Second, are plans now being made or under consideration for such an undertaking? and Third, if such a procedure is not in effect at present what is the attitude of the control agency toward such a proposal?

Replies were received from the responsible agency in each of 44 states. A study of the replies and comments indicated that no uniform nation-wide policy is followed in connection with this proposition. Only 3 of the 44 reporting states now require all laboratories, including official as well as commercial, to be certified with reference to equipment, methods and proficiency in carrying out standard methods for the bacteriological examination of milk. In 6 other states, performance and proficiency of municipal or county health department laboratories must be certified by the state agency, and in 2 states, laboratories must have state approval if their bacteriological results are used as the basis for premium payments to milk producers. In 4 states a voluntary plan of approval is followed in which case the laboratory in question requests that a survey be made, but in 2 of these 4 states laboratories conducting bacteriological work on milk and using results for official grading purposes must be certified by an appropriate state agency. In 3 states certification is required before an approved milk inspection service may be established and, in another, laboratories contracting to make official bacteriological examinations for municipal or county health departments must be approved by the state health agency. Thus only 15 of the 44 states reporting have any kind of plan currently in effect for the inspection, approval, or certification of laboratories performing bacteriological procedures on milk.

It is worthy of note, however, that 17 states now without any program of laboratory approval expressed an opinion favorable to it. Six additional states expressed no opinion. Five states indicated that there was an active planning now in progress for such a system

* Report of Committee on Milk Sanitation.

Summary of Data Relative to a Laboratory Certification Procedure

	1		2		3		4		5	
Number of states reporting	*Mandatory certification*		*Voluntary plan*		*Certified or premium payment*		*Certified for official work or for approved milk inspection service*		*Certification of contract laboratories doing official work*	
	State	*Agency*	*State*	*Agency*	*State*	*Agency*	*State*	*Agency*	*State*	*Agency*
44	Conn.	Health	Ind.	Health	Calif.	Agric.	Calif.*	Agric.	Ohio †	Health
	Delaware	Health	Mass.	Health	Vermont	Agric.	Ill.†	Health		
	Penn.	Health	New York	Health & Agric.			Iowa	Health		
							Minn.	Agric.		
			Texas	Health			Ore.	Agric.		
							Wash.	Agric.		

States not favoring proposal

State	*Agency*
Georgia	Health
Kansas	Agric.
Louisiana	Health
Maine	Agric.
Nebraska	Agric.
New Mexico	Health
South Dakota	State Chem. Lab.
Wyoming	State Chemist

States expressing no opinion

State	*Agency*
Alabama	Health
Florida	Agric.
Massachusetts	Health
Michigan	Agric.
North Dakota	Agric.
Tennessee	Health

* California requires certification under both items No. 3 and No. 4.
† Illinois and Ohio will survey other laboratories on request.

of laboratory appraisal and approval. Officials of 8 states, however, expressed themselves as not favoring such a plan or indicated they could see no particular occasion for it.

Thus if the number of states now following some type of laboratory certification is combined with those favoring the plan it is evident that 32 of the 44 reporting states have a preference for it.

As might logically be expected, a number of states favoring laboratory certification stated that while desirable, budgetary and personnel limitations were an obvious handicap. Also, several raised the question of approving other than official laboratories or laboratories which work for official agencies. Few favored the inclusion of milk plant laboratories under a certification plan.

It is the considered judgment of your committee and it so recommends that all laboratories doing official bacteriological milk control work be surveyed at regular intervals by qualified personnel from the laboratory staff of the state agency having jurisdiction in the field of milk sanitation.

This recommendation is especially pertinent at this time because of the important part laboratory results play in the certification of milk for interstate shipment. The significance of reliable laboratory results was recognized in the recent *Report of the National Conference on Interstate Milk Shipments* in which the following statement appears: "The state approval of local laboratories should include an annual visit to the laboratory at which time evaluation of the quarters, equipment, procedures, results, and records shall be made on appropriate survey forms of the U. S. Public Health Service or the equivalent." Laboratory procedures play a significant part in the evaluation of a milk supply and every reasonable effort should be made to insure that equipment methods and procedures in milk control laboratories are uniformly standard and comparable.

Further, it is the recommendation of

your committee that the results of this investigation be publicized among those persons and agencies concerned with this problem and that a copy of this report be furnished the state health officer, the director of milk sanitation and the director of laboratories in each state.

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St. Paul, Minn., *Chairman*
HAROLD J. BARNUM
EDWIN LUDEWIG
SAMUEL I. REED
ALEXANDER A. ROBERTSON
H. L. THOMASSON
HAROLD WAINESS

Meteorology and Air Pollution*

Engineering Section

THIS committee presented its first report in 1947, which report was a general review of atmospheric pollution and its control.

Following that report the committee decided to consider individually various aspects of atmospheric pollution, and in 1948 discussed the "Public Health Significance, Distribution and Control of Air-borne Pollens" (*Year Book*, 1948–1949, p. 86).

The present report deals with another important aspect of the subject which is meteorology. Harry Wexler, D.Sc., Chief of Scientific Services, U. S. Weather Bureau and a member of this committee, was asked to prepare a report on the meteorological aspects of air pollution. In addition to his extensive experience in the field of meteorology, Dr. Wexler was in charge of the meteorological studies made by the Weather Bureau of the air pollution incident at Donora, Pa., in 1948. His report entitled "Meteorology and Air Pollution" follows:

Gases and small particles released into the atmosphere move as a part of the atmosphere and are therefore subjected to all of the complex whirls and eddies that characterize the movement of air near the ground. If there were no means of removing the contaminants from the surface layer of the air in the neighborhood of the emission point, the atmosphere in that area would soon become intolerable for animal and plant life. The atmosphere exercises its cleansing action by means of the winds which move material horizontally away from the emission point and by vertical currents associated with convection or mechanically caused turbulence which enable the contaminants to be removed aloft.

There are approximately 2.5 million tons of atmosphere for each of the earth's two billion inhabitants. This huge mass has a tremendous capacity for storage. It can absorb great quantities of man-made pollutants without a noticeable increase in concentration, provided those pollutants are effectively dispersed throughout the atmosphere. However, in spite of this vast storage capacity, there must be means of removing pollutants from the atmosphere if large concentrations are to be avoided. Gravity, rain, and snow are some of the ways in which the atmosphere loses foreign material.

If we can assume that the atmosphere as a whole loses pollutants as fast or faster than man produces them, then from a meteorological point of view the problem of controlling pollution requires only that we prevent excessive concentration of the pollutants at or near their source. One way of doing this would be to develop artificial means of causing the pollutants to become dispersed through as much atmosphere as possible. Tall stacks partially accomplish this purpose; however, their efficiency is greatly dependent on weather conditions. Another method of controlling the concentration of pollutants would be to limit the rate at which they are released to the atmosphere during periods when meteorological conditions are unfavorable for their rapid dispersal. This has been established on a routine basis at places such as Trail, B. C., Cleveland, Ohio, and various AEC installations (Hanford & Brookland).

Although it is not within the scope of this brief discussion to treat in an exhaustive manner the methods by which atmospheric pollutions are dispersed from their source, it can be stated that the two factors most directly involved are *wind* and *vertical temperature gradient or lapse rate*.

Wind tends to carry the pollutant away from its source and to dilute it by turbulent mixing. If the temperature decreases rapidly with

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* Report of the Committee.

COMMITTEE ON AIR POLLUTION.

Organized 1946. Published Reports: *A.J.P.H.* June, 1948. *Year Book*, 1948–1949.

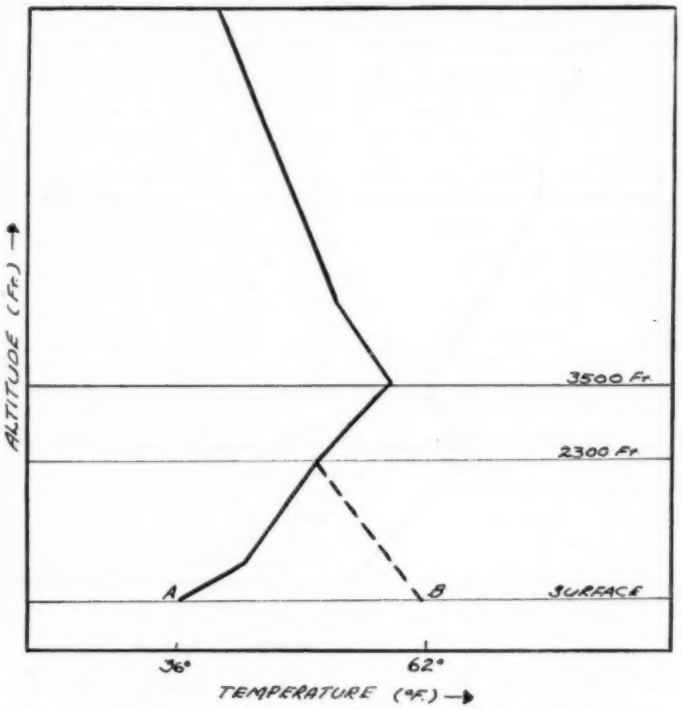

FIGURE 1 Temperature Height Curve for Atmosphere Stable in the Lower Layers. A and B represent temperatures before and after solar heating.

height, convection currents may distribute the pollutant through a greater depth of air, and thereby dilute it. On the other hand, if the temperature remains constant or increases with height, the pollutants may be retained near the ground, thus leading to excessive accumulation. The manner in which these two factors, wind and vertical temperature lapse rate, combine to determine the rate of dispersion may be seen by reference to the accompanying charts which show two extreme types of temperature-height relationships.

Figure 1 represents a temperature-height relation unfavorable for removal of pollutants. The temperature is 36° F. at the surface, and increases steadily with altitude up to an elevation of nearly 3,500 feet. Under this "inversion" condition, practically no vertical mixing is possible during the early morning, and this combined with the light wind movement typical of this situation (high pressure area or anticyclone), will tend to make pollutants released at the surface hug the ground and accumulate at their source. If the effluent is released at night from a tall stack, it may remain at the same height at which it was emitted until the solar heating causes it to be "fumigated" or diffused completely throughout the lowest layers of the atmosphere. If, by afternoon, the temperature should rise 26° to a value of 62° (point B), permitting vertical mixing to work up to an altitude of about 2,200 feet, this would thin out pollutants, but would not dispose of large quantities of them unless the wind should increase. In certain localities this type of stable meteorological condition may prevail for days before being terminated by a wind or a rain storm.

Figure 2 represents a temperature-height relation favorable to the rapid dispersion of atmospheric pollution. Although the surface temperature is exactly the same (36° F.) as in the previous case, the temperature falls off immediately above the surface ("lapse" condi-

Publications*

Engineering Section

THE Committee on Publications, John M. Henderson, Chairman, of the Engineering Section, submitted this, its first report, at the Seventy-eighth Annual Meeting. The special problem studied and reported on was that of publication needs to permit adequate outlets for worth-while papers and reports. A selected group of persons was polled and specific questions asked. The answers furnished the basis for the information and recommendations presented.

The content of the report is indicated by the section headings:

Quality, Scope and Quantity of Published Material
Need for Publication Outlets
Indicated Publication Outlets
Encouragement of Prospective Contributors
Information on (Existing) Publications
Discussions and Recommendations

The report has been mimeographed. Copies can be obtained from Professor Henderson at: School of Public Health, Columbia University, 600 West 168th Street, New York, N. Y.

* Report of the Committee. First published Report.

Rural Sanitation*

Engineering Section

THIS report is the third offered by the present committee. The three reports combined represent the committee effort to establish for the benefit of all Engineering Section members, the American Public Health Association, and others who may be interested, factual information concerning rural water supply and rural sewage disposal practice in the United States.

The major portion of the present report is devoted to a comparison of state practice with respect to private wells and recommendations of the Joint Committee on Rural Sanitation. The Joint Committee comprises representatives of several federal offices including the U. S. Department of Agriculture, Federal Housing Administration, Federal Security Agency, Public Health Service, Department of Interior, T. V. A., the Conference of State Sanitary Engineers, the Conference of Municipal Public Health Engineers, and the Veterans Housing Administration.

It is the belief of the committee that far too little importance is attached to the impact of both rural water supply and rural sewage disposal on the health and welfare of a significant proportion of the population of the United States. According to a report (1948)[1] of the Sanitary Engineering Division, Public Health Service, over 27 million people needed new or improved rural or private water systems; over 33 million people needed new or improved rural or private sewerage systems. Roughly then, 1950 finds between 70 and 85 per cent of the nation's population now dependent on such rural facilities in need of new or improved private water systems and/or sewerage systems.

Is it not important that 30 per cent of the nation's population, thus dependent, be afforded opportunity for safe water supply and sewerage system? The committee offers information, admittedly incomplete, which may prove useful to those who take the affirmative in the above question.

DEVELOPMENTS IN HOME SEWAGE DISPOSAL:

A. U. S. Public Health Service Research Project

The research project in progress at the Environmental Health Center, Cincinnati, Ohio, has been the means of compiling and presenting an analysis of comprehensive investigations, both field and laboratory, in a published report titled, *Studies on Household Sewage Disposal Systems*. The work program outlined in the 1947 report of this committee (*Year Book* 1947–1948, p. 92) continues. Under the conditions of the Cincinnati study there was little difference in the efficiency of suspended solids removal "between uncompartmented tanks of rectangular, oval, and circular shape, of approximately the same capacity and depth." Adequate capacity (at least 500 gallons suggested) appears as the criterion of such efficiency, although compartmentation may be desirable. Sludge has been found to accumulate according to the formula

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* Progress Report.
COMMITTEE ON RURAL SANITATION.
Organized 1947. Published Reports: *Year Books*, 1947–1948, 1948–1949.

V (gallons per capita) = 17 + 7.5 Y (years of service after cleaning).

A second report, "Studies on Household Sewage Disposal Systems, Part II 1950," which has been submitted for publication clearance, includes studies on septic tank compartmentation, inlet and inter-compartment flow appurtenances, soil percolation test methods, soil clogging, behavior of effluents. and absorption systems.

Current work includes study of tank depths, outlet penetration, compartmentation, percolation test methods, soil clogging, effect of sodium hydroxide (active agent in some chemical tank "cleaners") on tank and soil absorption behavior and further analysis of sludges and scum accumulation data from the field.

B. Other Research Activities

1. University of Michigan, Ann Arbor, Professor Earnest Boyce. The project has been completely curtailed because of lack of funds.

2. Rensselaer Polytechnic Institute, Troy, N. Y., Professor E. J. Kilcawly. No progress due to lack of funds.

3. Purdue University, West Lafayette, Ind., Professor D. E. Bloodgood. Studies are continuing on the development of a household incinerator for garbage and sewage solids.

4. National Clay Pipe Association, St. Louis, Mo., Mr. Hartung. Studies have been completed. However, no report was available to the committee at the time this report was prepared.

5. Ludwig Bros., Pasadena, Calif., for M. C. Nottingham Co., Harvey F. Ludwig.[2] Field tests were made to demonstrate efficiency of long, shallow tank, as compared to standard septic tank required in California. Conclusions reported high efficiencies under both uniform and surge conditions, with and without heavy sludge accumulations and it is further suggested that length-width ratios higher than 3:1 and depths shallower than 48″ may "effect a better degree of treatment than do standard tanks." Ratios as high as 20:1 length-width and depths as shallow as 30″ are suggested as limiting ratios.

6. Louisville and Jefferson County Board of Health, Louisville, Ky., A. P. Bell. A field study was made to determine whether (1) steel septic tanks were allowed, and (2) whether opinion favored the use of steel tanks in new installations. Based on a 69 per cent return to inquiries addressed to members of the Conference of State Sanitary Engineers and the Conference of Municipal Public Health Engineers, it was found that 22.1 per cent prohibited use of steel septic tanks; 48.8 per cent did not prohibit, but did not recommend use, 23.2 per cent had no objection, and 5.9 per cent reported no jurisdiction. Almost, without exception, preference was expressed favoring concrete or other masonry type material for septic tank construction.

C. Individual State F.H.A. Sewage Disposal Requirements

The F.H.A. is to be commended for its long, continuous efforts to achieve some degree of standardization in home sewage disposal requirements. During 1950 this organization has completed F.H.A. requirement bulletins in Maine, Maryland, Virginia, Missouri, Wisconsin, Iowa, Indiana, North and South Dakota, and Nebraska, to complete its bulletin coverage of the United States.

DEVELOPMENTS IN RURAL WATER SUPPLY

A. Research

As this committee has previously reported (*Year Book* 1948–1949, p. 106) there is a dearth of investigation on rural water supply problems. Developments in several parts of the United States serve to emphasize that real problems lie ahead in the conservation and pro-

tection of underground waters which serve as the principal source of rural water supply. Hopkins,[3] in discussing the Missouri Valley Development Program stated:

> Rural water supply, traditionally from ground sources, generally presents a special problem over a great portion of the basin. That which is available is very often undependable as to quantity and undesirable as to chemical and physical quality. During drought periods these underground supplies are soon depleted, and even stock water becomes a matter of extreme importance. The recharge of ground waters resulting from irrigation, canals, impoundments, and sustained stream flows should do much to alleviate this problem. In specific areas it is anticipated that domestic water will be taken directly from irrigation ditches. Attention has already been directed toward the need for an effective and reliable low cost system for purification of this water and its safe storage.

New importance is attached to the study of private water systems when it is reported by Bosch,[4] Waring,[5] Weart,[6] and others that methemoglobinemia due to nitrate nitrogen in rural water supplies has occurred many times; Minnesota from January, 1947, to September, 1949, reported 139 cases with 14 deaths. Tularemia in man is also contracted from domestic rural water supply. Jellison and his coworkers[7] made extensive investigations of the contamination of natural waters in Montana and found at least 3 human cases contracted from a single home water supply and recovered *P. tularensis,* from several stream waters. A special study in Gallatin County failed to find evidence of infection in any of the 75 domestic rural supplies investigated.

B. Individual State F.H.A. Water Supply Requirements

As indicated under rural sewage disposal (Section C above) the F.H.A. has published information in bulletin form for all types of water system likely to be utilized in homes built under F.H.A. loans.

C. Engineering Section Committee on Rural Sanitation

The committee has undertaken two projects since the last report.

I. Comparison of present state practices in requirements for private wells in the United States.

The committee prepared a questionnaire which was sent to all state sanitary engineers. The following information is based on information furnished from 34 states.

Thirty-one states have no clearly defined legal authority to supervise private water systems. Massachusetts, one of the few having such authority, provides under general law, ". . . towns and persons shall submit to said Department (Department of Public Health) for its advice and approval, their proposed system of water supply or of the disposal of drainage or sewage and no such systems shall be established without such approval. . ."

Four states—Nebraska, New Jersey, New Mexico, and New York—report a limited authority over individual water supply systems, which is obtained either by indirection or by specific application to realty subdivisions. New York State offers an excellent example of this limited, but specific supervisory authority.

Only 16 of the 34 states provide a direct advisory inspection service. Seven provide no inspection service and 5 provide only limited service. One depends entirely on local health officials and 5 do not indicate clearly that the service was offered.

The comment of Clarence I. Sterling, Chief Sanitary Engineer of the Massachusetts Department of Public Health is appropriate:

> Obviously it would be impracticable for the Department of Public Health to pass upon each and every individual well in the state. The activities of the Department are limited to advice to boards of health in such matters and to individuals requesting such advice. Local

boards of health have the power to require the owners of private premises to obtain a permit but very few local boards have included this requirement in their local health regulations.

All 34 states provide advisory service by bulletins. However, one depends entirely on local health services for dissemination of such information. Nineteen states participate directly in inspection activities when F.H.A. loans require water system approval. Two act only on a limited basis while 13 take no direct action in such investigations. Twenty states depend on local health services or F.H.A. staff inspection and, of these, 10 indicated local health department participation and 2 F.H.A. inspection as the only source of inspection service.

Subdivision plans are subject to approval in 20 of the 34 states, not subject in 3 states, and acted upon with limitations in 11 states. Assistance in such approvals is obtained through local health departments in 3 states and F.H.A. only in 1 state.

Data on the construction and location requirements in 34 states are presented in a table—A—Dug or Bored Wells, B—Driven Wells, and C—Drilled Wells.*

Significant comparisons with requirements of the Joint Committee [8] are shown in tables. The following pertain to dug or bored wells.

1. Ten foot minimum recommended depth of water-tight casing below ground is followed by 21 states, exceeded by 2 states and lower in 3 states. Two specify depth to rock or impervious strata, and 4 have no specific requirements.

2. Five inch minimum recommended height of casing above ground is exceeded in 24 states and lower in only 2. Six have no specific requirement, and 3 did not furnish sufficient information.

3. Twenty-six states follow or exceed the Joint Committee recommendation on distance from well to sewer (50'), although a few will allow lesser distance to cast iron than to vitrified clay sewer. Only 5 follow the recommendation for distance from well to septic tank, 22 recommend 50 ft., and one allows 30 ft., while 2 have no specific recommendation. The provision concerning distance to leaching systems is not very clear. The committee believes that some state engineers interpreted a leaching system to include cesspools and on that basis prohibited the installation of well and cesspool on the same property. Seventeen have a lower minimum distance with 11 states allowing 50 ft. separation. Seven states follow and 3 exceed the joint committee recommendation.

4. Nine states allow wells in basement, but 17 do not permit them. Four do not recommend basement installation, and 3 allow on a limited basis.

5. There appears to be no specific recommendation on minimum distance to property lines. Nine have limits on distance to side and rear property lines; 10 on front line separation.

The following pertain to driven wells:

A similar comparison is made for driven wells. However, their use is limited to certain localized conditions and no detailed comments, other than the tabular information, is offered.

The following applies to drilled wells:

1. The Joint Committee recommends well casing sunk to rock or other impervious strata. Four states have similar recommendations. Twenty-five states require depths ranging from 4 to 25 ft., with 18 requiring at least 10 ft. of casing. Only one state requires less than the Joint Committee recommendation for height of casing above ground. Twenty-three require more height, and 7 specify on the basis of conditions found if investigation is made.

2. The prevailing recommended distance separating drilled wells from sources of pollution is 50 ft. Nineteen states require this distance between well and sewer, although a few states permit lesser distances to cast iron sewer. Twenty-two states follow the same rule of separation for septic tanks, and 12 follow on leaching systems. Those following joint committee recommendations are 5, 5 and 6 states for sewer, septic tank, and leaching system respectively.

3. Sixteen states do not permit drilled wells in basements; 9 do. Three have limited permission, 5 do not recommend such installations.

4. Only 9 have distance limitations (15' is the popular limit) to side and rear property lines. Ten prescribe limits to front property lines.

* Editor's Note: Restriction of space prevented printing of tables.

Water-tight seals for drilled wells are required by 28 states when the casing ends above ground, 2 have no specific requirement, and 4 furnished insufficient data to classify. On the other hand, only 19 states allow below ground ending of properly sealed casings, and 9 have not allowed such practices. Two have no requirements and one does not recommend the practice. A single drop pipe for driven wells is permitted in 16 states, denied in 11 states, and allowed with limitation or not recommended in 3 states. Two states have no specific requirement, and 2 did not clearly indicate the requirement.

Only 9 states permit well pits, 11 do not allow them, 5 allow pits only when suitably drained and protected, 8 states specifically do not recommend the use of pits, while one has no specific requirement.

Favored casing materials are best shown by the following:

Type of Casing Material	*Driven Wells*	*Drilled Wells*
Concrete	0	1
Steel	17	21
Wrought Iron	12	13
Galvanized Iron	7	3
No Specific Requirement	10	8
Data Lacking	3	2

It is apparent that there is a wide variation in requirements, authority, and supervision in respect to private water supply. While the committee holds no brief for standardization in minute detail, there does appear room for a more widespread agreement than is shown in these data. Moreover, it is noticeable that the practices for private wells and F.H.A., are in many instances at variance. It is not always possible to refer to one of the state F.H.A. bulletins and feel secure in the knowledge that the same standards will be followed in non-F.H.A. installations. It is also the understanding of the committee that the interpretation of standards as they may exist will vary among local health departments in any given state. This too is desirable provided the bases of variation are sound practice and proven fact.

II. Rating system for rural ground water supplies.

The committee, at the request of the Engineering Section Council, has taken preliminary action in the development of a rating system for rural ground water supplies. The following is a progress report on that subject.

1. Only a few states have made any concerted attempt to rate rural ground water supplies. The committee has a smattering of information at hand concerning such ratings and invites any local or state health department which has developed such forms to send them to the chairman of this committee.

The states of Tennessee, Minnesota, and Texas have proffered rating schedules to the committee which are applicable to public systems and which may be used in a limited fashion for the smaller and less complicated rural water supply.

The Public Health Service, about 1941, developed a one page rating system patterned along the lines of defect checking utilized in milk plant, dairy farm, and restaurant sanitation check forms.

2. The committee is not at the present time in agreement on any proposal for a rating form which has practicality or applicability. Rather we have discussed 5 questions and solicit opinions on these questions from those who must face the problem of rural water supply sanitation.

The questions are:

a. What is the purpose of a rating schedule or of a rating system?
b. Should rating standards be so weighted that the absence of a particular important feature makes the particular water supply facility substandard?
c. Should the rating be based on what might be termed a median with plus values for improved facility above a given standard and minus values for facilities not meeting a given standard?
d. Should a rating system be based on perfection as 100 per cent with deductions for anything less than satisfactory?
e. What are the particular critical items

of rating which should be considered by our committee?

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Field Training*

Engineering Section

THE Subcommittee on Field Training herewith submits for your approval the report of its work for the current year:

SUBCOMMITTEE PROGRAM PROGRESS

The subcommittee originally proposed a four year study of the wide area of sanitation field training, according to the following time-table:

1. *1949*—Development of a broad basic outline covering the specific aspects of the study. Portions of the outline to be studied in detail for presentation as progress reports in 1950 and 1951. This basic outline, covering 13 broad aspects of sanitation field training, was developed and approved by the Committee on Training.
2. *1950*—Study and the development in report form of a major number of the items in the basic outline. This has been accomplished and is offered as the contribution of the subcommittee for the current year.
3. *1951*—Further study and development of the items in the basic outline. This activity will require joint considerations by the three subcommittees of the Committee on Training. This study will go forward and will be submitted as a progress report next year.
4. *1952*—Completion of the study and the preparation of a final report covering the 13 aspects of sanitation field training included in the broad basic outline. Judging by the widespread interest in the progress reports of the subcommittee to date, the final report should serve as a valuable tool for the guidance and orderly development of sanitation field training programs.

SUBCOMMITTEE REPORT FOR 1950

With the encouragement and assistance of the W. K. Kellogg Foundation, the University of North Carolina School of Public Health sponsored a working conference on sanitation field training, held in Chapel Hill during the period April 25–28, 1950. Twenty-nine representatives of 13 states, the Public Health Service, the W. K. Kellogg Foundation, the University of Massachusetts, and the U.N.C. School of Public Health participated in the working sessions. Reports and recommendations were prepared on the following subjects:

1. Objectives of Field Training for Sanitation Personnel
2. Types of Sanitation Personnel To Be Trained
3. Existing Patterns of Field Training for Sanitation Personnel
4. Types of Field Training for Sanitation Personnel
5. Principles and Practices of Field Training
6. Criteria for Field Training Areas
7. Administrative and Coöperative Relationships and Responsibilities of Agencies Concerned With Field Training Programs for Sanitation Personnel.

These studies and recommendations were released in July, 1950, as the report of the "First Nationwide Working Conference on Sanitation Field Training." Reproduced mimeographed copies of the original bound report have been made available as the contribution of the subcommittee for 1950. The report follows.

Committee on Training
ELLIS S. TISDALE, Communicable Disease Center, U. S. P. H. S., Atlanta, Ga., *Chairman*

Summary of this report presented at Seventy-eighth Annual Meeting, American Public Health Association, in St. Louis, October 31, 1950. Comments should be addressed to William C. Gibson, School of Public Health, University of Michigan, Ann Arbor, Mich.

* Report of the Subcommittee on Field Training of the Committee on Training. Organized 1948.

Subcommittee on Field Training
WILLIAM C. GIBSON, School of Public Health, University of Michigan, Ann Arbor, Mich., *Chairman*
HAROLD S. ADAMS
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First Nation-Wide Working Conference on Sanitation Field Training

THIS is the report of the First Nation-wide Working Conference on Sanitation Field Training. It is a record of the combined efforts of a widespread group to begin to shape in an orderly manner the recognized elements of field training practice into a successful pattern for sanitation workers.

Field training for public health workers is not a new endeavor. It has been generally accepted that the adequate preparation of public health workers requires not only formal academic training but also guided opportunities to study and to participate in the field application of the principles and practices of public health.

Field training has been incorporated as a part of the formal education of public health nurses and public health educators for some time. It is an optional elective at present in several schools and universities for sanitation and other public health students. The time is no doubt close at hand when field training will be integrated with academic programs in the curricula for all public health students in accredited schools and universities.

An increasing number of states are developing field training programs. One report indicates that programs of some kind were conducted in 42 states in 1947 by official and voluntary health agencies. This growth is indicative of the needs which exist for further training of public health workers, including sanitation personnel.

It is generally recognized that sanitation field training programs throughout the country present a wide variety of patterns and methods. A real need exists for means to exchange and evaluate techniques, plans, and programs, in order to bring about a wider understanding of basic principles and time-tested practices for the accomplishment of accepted field training objectives.

To this end, and with the encouragement of the W. K. Kellogg Foundation, the School of Public Health sponsored the Working Conference as an exploratory measure to determine if worthwhile results could be obtained by bringing together a widespread group interested and active in the conduct of sanitation field training programs. Ten of the states invited to send a representative were those to which financial grants have been made by the W. K. Kellogg Foundation for assistance in the development of field training programs.

Twenty-nine representatives of 13 states, the Public Health Service, the W. K. Kellogg Foundation, the University of Massachusetts, and the University of North Carolina School of Public Health met in Chapel Hill for four days in late April, 1950. They established the Working Conference objectives and agenda, and developed a plan of action. Small committees prepared progress

reports on agenda topics for discussion by the Conference group. Final reports and recommendations were developed as the results of group expression.

Much was accomplished in committee and group work, largely because of the willingness of each participant to share his experiences and to participate freely in the discussions. The Working Conference was a real learning experience for all. The results are believed to be a sound forward step in the orderly analysis of sanitation field training problems.

To all those who attended and participated in the Working Conference, the School of Public Health expresses its thanks. To the committee consultants, chairmen and secretaries, to the "Roving Consultants": Drs. Kinde, McGavran, and Mountin, and to the discussion leaders, the Department of Field Training acknowledges its gratitude.

TOPIC: "Objectives of Field Training for Sanitation Personnel"

SCOPE OF TOPIC: To define the general and specific objectives of field training for sanitation personnel.

CONFERENCE REPORT AND RECOMMENDATIONS:

A. General Objectives
1. To guide the individual into a community health program with a minimum expenditure of time and funds.
2. To provide opportunities under supervision to study and to participate in the field application of the principles and practices of public health.
3. To develop confidence and skill in the analysis and solution of public health problems.
4. To broaden concepts of public health.
5. To stimulate continued professional growth and development.

B. Specific Objectives
1. To develop an understanding of the purposes, organization, and functions of a local health department.
2. To appreciate the functions and to learn to use the resources of official and nonofficial local agencies, such as: the Board of Health, the County Agricultural Agent, the Medical Society, civic and fraternal organizations, service clubs, etc.
3. To develop familiarity with the functions and the relationships of state and federal agencies to local health departments; i.e., state departments of health, agriculture, education, conservation, etc.—The Public Health Service, Children's Bureau, Fish and Wild Life Service, etc.
4. To develop a realization of the relative importance of the environmental sanitation program in the total community health program.
5. To learn to apply basic principles and theory to the analysis and solution of community sanitation problems.
6. To develop ability to measure and approach sanitation problems in their priority order of importance to the total community health needs.
7. To develop an understanding of the continuing need for community education, group planning, and participation for the solution of community sanitation problems.
8. To develop skill in the use of the inspectional procedure as an educational technique.
9. To develop an appreciation of the value of "service giving" in obtain-

ing coöperation and accomplishments by rendering direct technical aid and advice on specific problems—such as assistance on the lay-out of a restaurant kitchen, establishing a grade-line for a septic tank installation, etc.

10. To improve skills, under guidance, in dealing tactfully and effectively with the public in making investigations, interpreting problems, preparing written reports and correspondence, and making oral presentations before groups.
11. To develop an increasing knowledge of federal, state, and local health laws, ordinances, and regulations, and to learn their application in the solution of health problems.
12. To develop ability to evaluate critically existing methods in meeting the changing needs of community sanitation.
13. To develop an appreciation of the value of records for determining progress and evaluating health status, and to develop skills in the collection and analysis of record and survey data.
14. To learn to work as a member of the health department staff team.
15. To develop an appreciation of current social and economic problems related to public health.

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TOPIC: "Types of Sanitation Personnel To Be Trained"

SCOPE OF TOPIC: The full development of all training programs, academic and field, must take into consideration the types of personnel to be trained—that is, their previous training and experience, as well as their present needs and abilities, all in light of the type of position to be held and the nature of the job to be done by the person being trained.

When one studies the personnel situation in the field of public health sanitation throughout the United States, one is amazed at the variation in educational requirements for apparently similar positions. These requirements range from less than high school graduation to completion of a year of graduate study in a school of public health.

Many states justify their low educational requirements for sanitation personnel on the basis of the shortage of workers with higher qualifications. Nobody can deny that tremendous shortages existed during the war years and that standards had to be lowered if positions were to be filled. Leading practitioners in sanitation realize that these conditions do not prevail today.

Many states in the last year or two have revised upward their merit system educational requirements for sanitation personnel. Others are studying their problems and needs in the same light.

Wishing to be wholly realistic about the matter of types of sanitation personnel to be trained, the Conference recognized that the hope of the present and the future for improved sanitation practice was inseparably tied to the adequate preparation and training of personnel recruited. The continuous recruitment of personnel with inadequate preparation is a vicious cycle leading to chaos in sanitation practice, even with inservice programs designed to provide stopgap training.

The Conference recognized a tremen-

dous need for sanitation personnel with adequate academic preparation integrated with suitable field training in order to meet current and future demands of states with sound personnel policies. These types of personnel are listed below.

Realizing the continuous need in some organizations for numbers of subordinate personnel, the classification of "Sanitary Inspector" is included below with the full understanding that this type of worker should perform only under adequately trained supervisory sanitation personnel.

The Conference recognized that a real need exists for training programs for those employees without adequate academic preparation who were recruited into sanitation programs during the war years. These workers have been classified as "War Emergency Personnel" in the Conference report below. The further recruitment of such workers is not believed to be sound or justifiable.

The recommendations of the Conference for details of the field and inservice training programs for personnel listed below are to be found in the Conference report on "Types of Field Training for Sanitation Personnel."

CONFERENCE REPORT AND RECOMMENDATIONS:

A. Trained Personnel to Meet Current and Future Needs

1. Engineer
   Academic Preparation: Graduate of full four year course leading to baccalaureate degree in engineering. Eligible for admission to examination for licensure to practice professional engineering in state of employment.
   Field Training: 12 weeks supervised field experience.
2. Public Health or Sanitary Engineer
   Academic Preparation: Graduate of full academic year of graduate study in public health or sanitary engineering in addition to above academic requirements for "Engineer."
   Field Training: 12 weeks supervised field experience.
3. Sanitarian
   Academic Preparation: Graduate of full four year course leading to baccalaureate degree from recognized college or university accredited by the American Association of Universities, with major study in sanitary science (preferable) or the physical and biological sciences. Additional formal academic training in public health and sanitation desirable, leading to title of "Professional Sanitarian."
   Field Training: 12 weeks supervised field training.

B. Untrained Personnel for Selected Subordinate Positions

1. Sanitary Inspector
   Minimum Academic Preparation: Graduate of full four year course leading to high school diploma.
   Minimum Special Job Training: 12 weeks inservice apprenticeship training plus topical short course programs.
2. War Emergency Personnel
   Minimum Academic Preparation: Graduate of full four year course leading to high school diploma.
   Minimum Special Job Training: 12 weeks inservice apprenticeship training plus topical short course programs.

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TOPIC: "Existing Patterns of Field Training for Sanitation Personnel"

SCOPE OF TOPIC: Complete and reliable information on existing patterns of field training for sanitation personnel is apparently not readily available. Existing survey data are incomplete. It is hoped that the studies of public health training programs now being conducted by the Public Health Service may be broadened to include field training activities.

A complete overview of existing patterns is desirable in understanding and evaluating current methods in the administration and conduct of field training programs.

In addition to reports of individual state field training programs, the following references are helpful in understanding the nature and scope of past and current activities:

1. "Field Training for Public Health Workers," Bureau of States Services, Public Health Service. (A preliminary report of the 1947 study of field training programs.)
2. "Field Training for Public Health Personnel In the Michigan Community Health Project," W. K. Kellogg Foundation. (A report of the training methods used in seven training center county health departments.)
3. "Field Training of Public Health Workers: 1946–1949," Training Division, Communicable Disease Center, Public Health Service. (A report of the activities of the Training Division in assisting states with field training programs.)

The survey conducted of the existing patterns of field training for sanitation personnel used by the states and agencies represented at the Conference provided further insight into current methods in use.

The Conference report given below is an effort to summarize the most apparent patterns of field training for sanitation personnel. It was recognized that the summary may be incomplete because of the absence of information on many of the programs in operation. Reference 1 above indicates that official and voluntary health agencies in a total of 42 states were being utilized during 1947 as field training centers for public health workers. Full details of these programs as they may have applied to sanitation personnel were not available.

CONFERENCE REPORT AND RECOMMENDATIONS:

A. Centralized Training Plan

1. State Center

   Single health department center used for all field training activities. Special training staff and facilities provided by state funds. Generalized and specialized training programs conducted by special staff, health department staff, and selected state health department personnel. Field experience provided through affiliated local health department. Program usually administered at state level and supervised at local level.

2. Regional Center

   Centralized station serving groups of states. Usually coöperative enterprise between Public Health Service, states, university, and one or more local health departments. Fulltime staff provided by Public Health Service. Facilities and supplementary staff usually provided by coöperating health agencies. Generalized and specialized training programs conducted. Field experience provided through affiliated local health departments. Program usually administered by

affiliated local health department or university and supervised by resident training staff.

B. Decentralized Training Plan
   1. State Centers
      Multiple local health departments used for field training activities. Staff and facilities usually supplemented by state funds. Generalized training program conducted by staff of local department. Field experiences closely developed around basic service programs. Program usually administered at state level, with guidance of overall advisory committee, and supervised at local level.

C. Types of Programs Conducted
   1. Generalized
      a. Supervised field experience programs for graduate engineers and sanitarians without formal academic training in public health. Usually 12 weeks in length.
      b. Supervised field experience programs for graduate engineers and sanitarians with additional formal academic training in public health, sanitary engineering, and/or environmental sanitation. Usually 12 weeks in length.
      c. Apprenticeship programs for new workers without academic preparation. Usually 9 to 12 months in length.
      d. Orientation programs combining didactic and field work for new workers without academic preparation. Vary from 3 to 12 weeks in length.
      e. Orientation-Field Practice programs for experienced workers without academic preparation. Usually 8 weeks in length.
   2. Specialized
      a. Didactic-Field Practice topical short course programs. In addition to many of these and other topical types of courses conducted by individual states, regularly scheduled courses of this nature are conducted by the Public Health Service in insect and rodent control, housing hygiene, stream pollution, radiological safety, water, milk, and food laboratory practice, etc. Vary from days to weeks in length.
      b. Miscellaneous types of continuation education, refresher and in-service programs. Vary from 1 day to 1 week in length.

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TOPIC: "Types of Field Training for Sanitation Personnel"

SCOPE OF TOPIC: The Conference recognized that field training must be kept separated in our thinking from academic or didactic training. Although it is necessary and expedient in many situations to give such academic or didactic instruction concurrently with field training and as a part of the same program, it is important to separate the two components in our considerations of field training.

Twelve weeks was considered by the Conference as the minimum period for a satisfactory field training program, and when didactic work is included the time planned for it should be additional.

The Conference accepted in principle the several types of field training recognized by the A.P.H.A. Committee on Professional Education. It was felt that the broad objectives of all these types of field training are the same and that

the principle differences are in the emphasis and time distribution.

Accordingly, the Conference set up the specifications of a field training program deemed reasonably adequate to meet the requirements of the types of workers recommended in the Conference report on "Types of Sanitation Personnel To Be Trained," showing suggested time allocation to the various elements of the field training experience.

It was recognized that all field training programs should be flexible enough to allow the adjustments necessary to meet the individual needs of the trainee as determined by previous training and experience, demonstrated abilities during the field training period, and the specific position for which he is being trained.

The Conference agreed that it is not advisable at this time to set forth such a standard plan of field training for personnel with public health experience but inadequate academic preparation. The individual needs of these workers should be analyzed and the program plan developed and adjusted accordingly.

CONFERENCE REPORT AND RECOMMENDATIONS:
Given as chart presentation below.

TYPES OF TRAINING FOR SANITATION PERSONNEL

Types of Personnel to be Trained [1]	*Elements of Field Training* [2] *Orientation*	*Observation*	*Participation (Immediate Supervision)*	*Participation (Close General Supervision)*	*Responsible Participation (Gen. Supervision)*	*Special Didactic Training*
Engineer	a,b,c,d,e (±2) *	f,g,j (±3) *	g (±2) *	g (±3) *	h (±2) *	
Public Health or Sanitary Engineer	b,c,d,e (±2)	f,g,j (±2)	g,j (±2)	g,i,j (±2)	h,j (±4)	
Sanitarian	a,b,c,d,e (±2)	f,g,j (±3)	g (±2)	g (±3)	h (±2)	
(Professional Sanitarian)	b,c,d,e (±2)	f,g,j (±2)	g,j (±2)	g,i,j (±2)	h,j (±4)	
Sanitary Inspector	a,b,c,d,e (±2)	f,g,j (±4)	g,i (±3)	g,i (±3)		(±6) *
War Emergency Personnel	Special Inservice Apprenticeship Training (Minimum 12 weeks)					(±6) *

Code Used in Chart

a. Public health philosophy
b. Public health organization
c. Public health programs
d. Activities of other staff members
e. Community agencies and resources
f. Health education activities
g. Environmental sanitation activities
h. Planning and conducting programs
i. Emphasis on job specialty
j. Specialized operations

* Time in weeks, i.e. (± 2), is 2 weeks, etc.

(1) See Conference report on "Types of Sanitation Personnel to be Trained."

(2) See Conference report on "Principles and Practices of Field Training." When all of these elements are included in the training program, it is recognized as "Supervised Field Experience."

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TOPIC: "Principles and Practices of Field Training"

SCOPE OF TOPIC: Recognizing the existing wide diversity in methods of field training for sanitation personnel, the Conference tackled the task of establishing suggested principles and practices to guide in the more uniform development and improvement of present and future programs.

The recommendations listed below reflect the varied experiences of the Con-

ference members in the conduct of field training programs for sanitation personnel, and represent the results of group thinking in defining desirable principles and practices to meet the stated objectives of these programs.

Although the principles and practices outlined below were recognized to apply generally to the several types of field training defined by the A.P.H.A. Committee on Professional Education, they were developed particularly with the "supervised field experience" type of training primarily in mind. It was accepted that the paramount need at present and in the immediate future was for field experience programs designed to guide sanitation personnel with academic training into community health programs.

CONFERENCE REPORT AND RECOMMENDATIONS:

A. Principles

1. Supervised field experience should be provided only for the graduate engineer and the graduate sanitarian. Other recognized types of field training may meet the needs and abilities of personnel with less training.
2. An academically qualified person without public health sanitation experience should receive generalized sanitation field training. "Generalized" shall mean the recognized components of a sanitation program, such as those included in the A.P.H.A. Sanitation Evaluation Schedule.
3. The training should be conducted as an integral part of the sanitation program of a well rounded health department, and should be under the immediate direction of the supervisor of sanitation.
4. The service program conducted by the local department should include all the elements necessary and recommended by the state health authority for a well rounded program. The program should be continually improved.
5. Operation of the service and training programs should be done in such a way that neither reduces the effectiveness of the other.
6. The field training period for the trainee with academic preparation as indicated in 1 above, should not be less than 12 consecutive weeks. Upon satisfactory completion the accomplishment should be such that the trainee is capable of assuming responsibilities under supervision.
7. Training patterns should be developed to as great an extent as possible through group planning.
8. The training should be developed with consideration to the individual needs and abilities of the trainee.
9. Academic and field training should be integrated.
10. Applicants for training should be carefully selected.
11. Necessary additional facilities and personnel to meet training needs should be furnished to the training center.

B. Practices

Basic Training Procedures Applied Prior To Arrival of Trainee. Staff Preparations:

1. Preparation of community
2. Preparation of health department staff
3. Preparation of trainee
4. Program plan completed
5. Facilities prepared
6. Housing for trainee arranged
7. Travel for trainee arranged
8. History of trainee reviewed

Basic Training Procedures Applied During Orientation Period. Orientation of Trainee to:

1. Training center structure and facilities

2. Staff
3. Training policies (hours, vehicle use, leave, etc.)
4. Health department service program
5. Community
6. Official and nonofficial agencies
7. Health department procedures and policies
8. Specific sanitation elements in the training program

Basic Training Procedures Applied through Field Experiences (Observation and Participation):

1. Trainee group observation and discussion of establishments and/or installations, conducted by training supervisor.
2. Individual trainee observations of procedures at establishments and/or operations, conducted by sanitation staff members.
3. Trainee applies procedures previously observed, under direct supervision of sanitation staff members.
4. Trainee applies procedures alone followed by conference with training supervisor.
5. Trainee analyzes program by written and oral reports.

Basic Training Procedures Applied throughout the Course:

1. Planned individual conferences between trainee and training supervisor.
2. Instruction in the analysis of an area and in the development of necessary sanitation programs.
3. Development of ability to plan, accomplish, and evaluate work by example and by opportunity to do so under supervision.
4. Familiarity with programs not operating in training area is accomplished by special trips, reading assignments, audiovisual aids, visiting lecturers, etc.
5. Periodic and final evaluation of trainee by training supervisor.
6. Final report and evaluation of training program by trainee.

Special Training Techniques Applied through Field and Office Experiences:

1. Group conferences of trainees and selected staff members to discuss field work problems, special projects, report on assigned readings, etc.
2. Group conferences of trainees (nursing, health education, administration, sanitation, etc.) to discuss matters of mutual interest.
3. Trainee participation in general, divisional and administrative staff conferences.
4. Trainee planned talks to staff or community group and participation in group discussions.
5. Trainee preparation of news articles, radio releases, literature, exhibits, etc.
6. Planned work experience for trainees, such as: building septic tank, assisting in operation of pasteurization plant or food processing plant, etc.
7. Trainee preparation and use of maps, graphs, flow diagrams, etc.
8. Conduct of special projects by trainee, such as: watershed survey, cross-connection survey, utensil swab-testing, etc.
9. Trainee experience in use of training aids, such as: audiovisual and photographic equipment, etc.
10. Planned trainee experiences in the use of the public health laboratory and in the interpretation of laboratory reports.
11. Oral and written quizzes to test trainee comprehension and to promote group discussion of quiz questions and answers.
12. Confidential trainee reports to state director of sanitation field training, giving personal impressions, comments, and evaluation of specific training procedures and experiences. These reports are

recognized as a means of enabling the trainee to think about and record his reactions to his training experiences.

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TOPIC: "Criteria for Field Training Areas"

SCOPE OF TOPIC: The Conference recognized the necessity for certain standards to serve as a guide in the development of field training areas for sanitation personnel. It agreed that the minimum standards established by the A.P.H.A. Committee on Professional Education (1947) were acceptable in principal as long-range criteria but that they were somewhat idealistic for general use at present and in the immediate future.

Currently, increased interest and activity have centered around the matter of field training, due to the necessity for developing and approving residency training programs for physicians in public health seeking specialty certification by the American Board of Preventive Medicine and Public Health, Inc. Furthermore, an increasing interest in field training has been shown by state departments of health, schools of public health, and universities training potential public health workers. The desirability of providing opportunities for further study and to apply in the field the principles learned in the classroom is becoming increasingly apparent to these agencies and to public health students.

The need was recognized for somewhat modified criteria which would permit the development and approval of suitable field training areas to meet current demands.

It was further felt that it would be desirable during the present time of expanding interest in field training to have close agreement between the various professional groups in the matter of criteria for field training areas for public health workers.

Accordingly, the Conference studied and accepted in principle, with slight modifications, the "Desirable Characteristics of a Field Training Area for Public Health Personnel" as defined by the Ann Arbor Conference on Accreditation of Field Training Areas (1950). It was felt that these interim criteria could be met reasonably by areas to be approved for sanitation field training.

The Conference report on Criteria for Field Training Areas, given below, is essentially the report of the Ann Arbor Conference with minor modifications designed to identify it more specifically for sanitation workers.

CONFERENCE REPORT AND RECOMMENDATIONS:

1. Director of Field Training at state or local level responsible for the state or local program, with administrative public health experience and with educational qualifications, aptitude and enthusiasm.
2. Training program developed and recommended (to responsible agency) by state and/or local advisory committee representative of the educational, professional, and service interests concerned.
3. Consultative services to be available through state or other sources to supplement local staffs in basic and specialized public health fields.
4. Local health departments with well established broad programs of service exhibiting better than average

performance; directed by full-time medical health officers, well qualified and eager to make the departments effective for the public and for teaching, and with staffs adequate to provide above average routine services; serving populations suitable in size and character to offer example and field experiences in all of the basic functions of local health departments; facilities appropriate for efficient and economic local health services.

5. Responsibility for administration of the field training programs at the local level to rest with the local medical officer of health and his staff.
6. Distributed fields of training outside of local health departments to be the responsibility of the state health department, and to meet qualifications similar to those listed under 4 as to personnel, performance, and facilities, both in official and voluntary agencies and in general or specialty fields of public health.
7. The field training period for sanitation personnel should be of not less than 12 weeks duration—the distribution of time to be consistent in curriculum principles agreed upon by the state advisory committee and covering all phases of the environmental sanitation program.

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TOPIC: "Administrative and Coöperative Relationships and Responsibilities of Agencies Concerned with Field Training Programs for Sanitation Personnel"

SCOPE OF TOPIC: In the light of the experience of the Conference members it seemed desirable to highlight certain successful administrative patterns. It is recognized that certain of these items are included in the Conference report on "Criteria for Field Training Areas." However, the nature of the items in respect to the subject topic and the qualifying remarks make some repetition and expansion desirable here.

The successful conduct of field training programs requires the coöperative efforts of a number of agencies and groups. Effective program planning and good administrative practice make it essential to recognize and utilize the full resource value of these groups, and to indicate the functional capacity of each in the overall program.

The Conference studied the recommendations made for "Responsibilities of Various Agencies" by the A.P.H.A. Committee on Professional Education in its 1947 report on "Field Training of Public Health Personnel" and agreed in principle with the enumerated points. Specific suggested responsibilities of educational institutions, the Public Health Service, voluntary and other agencies are listed below for particular emphasis.

CONFERENCE REPORT AND RECOMMENDATIONS:

A. Advisory Committee on Field Training
   1. May be subcommittee of broad overall Advisory Committee on Field Training or part of membership of such overall committee.

2. Responsible for recommending policies and procedures related to planning, content, conduct, guidance, coördination, evaluation, and trainee selection for all sanitation field training programs.
3. Minimum membership to be representative of:
   a. Educational institutions providing instruction in public health, sanitary science or sanitary engineering and preferably those using subject field training facilities.
   b. State director of sanitation field training.
   c. Local units participating in the field training programs.
   d. Other official and voluntary agencies participating in the field training programs.

B. Administration of Sanitation Field Training Programs
1. Responsibility for overall state program to rest with the state department of health. The program to agree in principle with the recommendations of the Advisory Committee.
2. Responsibility for administration of the field training programs at the local level to rest with the local medical officer of health and his staff. The actual program to follow in detail the recommended program of the Advisory Committee as adopted and defined by the state department of health and as promoted by the state director of sanitation field training.

C. Responsibilities of Educational Institutions
1. To provide adequate academic instruction in the fundamental principles and practices of public health, sanitary science, and sanitary engineering.
2. To serve as research centers for technical problems related to environmental sanitation and for the development of field training techniques.
3. To offer consultative service on the planning and conduct of field training programs.
4. To assist with the coördination of academic and field experiences.
5. To make available specialized instructional personnel and physical facilities.
6. To recognize the necessity for adequate field experience, integrated with academic training, as part of the required basic preparation of sanitation personnel.

D. Responsibilities of the Public Health Service (listed in suggested priority order).
1. To make financial grants available to states for the development and continued support of field training programs.
2. To train field training specialists, and to loan such personnel to assist in the development and conduct of state training programs, including teams for highly specialized training activities.
3. To develop and make available to states various training materials, such as manuals, visual aids, models, exhibits, etc.
4. To assist in the development of regional field training programs for those areas where individual state programs are not feasible.
5. To serve as research centers for the development of field training techniques.

E. Responsibilities of Voluntary Agencies Interested in Advancing Field Training Programs
1. To sponsor or co-sponsor occasional conferences with nation-wide representation of personnel engaged and interested in sanitation field training activities in order to exchange ideas and experiences, to bring about a wider understanding of field training principles and procedures,

and to stimulate group thinking for the improvement of field training programs.

2. To stimulate and support the preparation, publication, and distribution of reports and periodicals on field training in order to help advance the sound development and continued improvement of programs.
3. To offer consultative service on the planning and conduct of field training programs.

F. Responsibilities of Other Agencies Coöperating with Health Programs and Interested in the Advancement of Field Training Programs (official and nonofficial agencies, industry, etc.)

1. To make available selected technical, administrative, and operative personnel for specialized instruction.
2. To loan specialized equipment and tools and to make available selected facilities for demonstration purposes.

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Looking Ahead

The job is not ended. In fact, it has just begun.

The Working Conference conclusions and recommendations are not meant to be final answers. However, they can serve as guide markers to states and agencies pioneering in field training programs, and to those interested in the improvement of present programs. They should be studied, tested, evaluated—and the deficiencies brought to light.

Other elements of sanitation field training need definition and study—particularly those dealing with financing of programs and the objective evaluation of results.

The true value of conferences such as this one, and conference reports such as this, will be measured in their usefulness in helping to improve sanitation field training programs.

To this end, this report will be distributed to each of the 48 state departments of health and to selected agencies and individuals interested in field training, including the Sections and appropriate committees of the American Public Health Association.

If the response is encouraging, periodic follow-up conferences of this nature should be held to speed the process of evolving recommended patterns of field training for sanitation workers.

Undergraduate Training*

Engineering Section

YOUR Committee on Undergraduate Training submits its report of progress made during the past year. The committee accepted as the purpose of its appointment the desire of the Section to define in general terms the desirable educational background of personnel, currently designated as sanitarians, working in the sanitation field of public health. Some confusion as to the function and purpose of such personnel existed at the beginning and it was reported last year, that until some clarification of qualifications and duties was made, this committee found it difficult to delineate any course of undergraduate training. During the past year, however, numerous actions by various groups has greatly assisted the committee in its deliberations and decisions. Especially valuable in this respect was the meeting called by Assistant Surgeon General Mark D. Hollis in January when educators and health officials met in Washington, D. C., and defined the needs for engineering personnel, and the Conference on Field Training held at Chapel Hill, N. C., in April.

The committee also was aware of the fact that at least 9 universities and colleges (University of Washington, Washington State College, University of California, San Jose Teachers College, University of Denver, University of Oklahoma, University of Indiana, University of Massachusetts, and Rutgers College) were providing courses leading to a degree of Bachelor of Science in Public Health or Sanitation, and the University of Michigan was offering a similar course this fall for students desiring to enter the public health field.

It appeared, therefore, to the committee that the need to define a base curriculum for students desiring to enter the multiphasic field of public health without engineering core courses was imperative. The many fields of sanitation of the environment seem to definitely demand personnel trained in sanitary sciences other than those specifically included in the training of an "engineer." The training that presently is given in engineering schools is for the purpose of providing persons equipped to build structures, highways, bridges, etc., to design water and sewerage systems and treatment works, and other well recognized engineering applications. There is not the same kind of engineering application in the field of environmental sanitation. Over a period of time the needs of public health have changed the concepts of sanitary engineering to include many other activities, some of which require proficiencies not included in an engineering curriculum, and some wherein the engineering curriculum as now provided supplements but does not supplant the need for basic sanitary sciences.

As we view the current demands of public health there is a nation-wide need for not merely trained technicians in specialized fields of work but for well-bred persons with ability and judgment to do a good job in working with people and helping them work out their problems.

In developing a curriculum for undergraduate education it is also recognized that completion of the course should in no way establish a ceiling in the educational development of the student. It

* Report of the Subcommittee. COMMITTEE ON TRAINING. Organized 1948.

should be a step in the student's development which permits his acceptance of a responsible position and provides the further opportunity at a later date to return to school for continued education.

Since the fields which he may turn to after initial experience are many, the undergraduate instruction should include sufficient laboratory work in chemistry, bacteriology, and the basic sciences to permit the individual to decide finally to work in the sanitary laboratory services, in health education, medicine, or engineering.

To accomplish these objectives and to provide the personnel so vitally needed by all agencies (governmental, industry, and lay organizations) interested in the sanitary control of the environment the following curriculum is recommended:

PURPOSE

The proposed curriculum provides a broad basic education in the physical, biological, and social sciences, with concentration during the junior-senior years in the sciences concerned with the environment. The educational experience should be sufficiently broad in subject matter so that students are given opportunities to become interested and later specialize in allied fields, such as health education, medicine, engineering, and the sanitary laboratory services.

PROGRAM OF STUDY

The program of study for students concentrating in environmental sanitation on the undergraduate level should involve four years and a summer of academic work. The program should include:

I. General Education
II. Concentration
III. Supervised Field Training

I. *General Education*

The first two years of the program should provide a general educational experience involving the *minimum* number of semester credit hours indicated in each of the following broad areas of study.

	Minimum sem. Credit Hours
A. English, including speech	9
B. Mathmatics, including trigonometry and analytical geometry	6
Note: It is recommended that the student plan to take integral and differential calculus either as a part of his general education or during his concentration program.	
C. Science	
1. Chemistry, including general inorganic and qualitative	8
2. Physics, including mechanics, sounds, heat, light, and electricity	6
3. Biology, including general zoölogy and introductory bacteriology	6
D. Social Sciences and Humanities, including psychology, economics, sociology, history and/or political science	12

II *Concentration*

The concentration program during the junior-senior years should include:

	Credit Hours
A. Additional Science	
1. Sanitary bacteriology	4
2. Organic chemistry	3
3. Fundamentals of entomology and/or parasitology applicable to vector and pest control	3
B. Introductory courses concerned with the basic principles involved in health practice, namely, health administration, communicable disease control, biometry, and health education, and presented in a manner to provide adequate orientation in public health science	8–12 (Recommended)
C. A series of courses concerned with the study of environmental factors affecting the public health and the application of the basic sciences of physics, chemistry,	

and biology to the solution of these various problems — 10 (Recommended)

D. Classroom and laboratory instruction in the application of the sanitary sciences to solution of problems of the environment supported by appropriate field demonstration of practice — 10 (Recommended)

III. *Field Training*

A supervised field training experience of not less than 12 weeks should be required as part of this educational program. The field training experience should include orientation, observation and active student participation in an operating program.

Attention is directed to the use of the words "minimum number of semester credit hours" (I. General Education). The addition of further "electives" is necessary to provide the required credit-hours for graduation; such electives should in every case, however, be wisely chosen to augment the general education and/or the concentration in a specialized or general direction, dependent upon the student.

Supplemental to the curriculum proposed, the committee further attaches its opinion as to where this education can be applied, both as to "scope of the programs," and as to the "placement" and "employment opportunities for the graduate."

SCOPE OF THE EDUCATIONAL PROGRAM

The fields of sanitation into which the principles covered in this program of study permit the student to apply his education include:

A. Protection of water supplies
B. The safe disposal of liquid and solid wastes
C. Comprehension of sanitary problems involved in the production, distribution, and handling and serving of food and milk
D. Control of insects and rodents
E. The abatement of nuisances
F. Adequate and healthful housing

Note: This list should be supplement to include all phases emphasized in the instruction program.

PLACEMENT OPPORTUNITIES FOR GRADUATES

Group A—
1. General Sanitarians
2. Milk Sanitarians
3. Food Sanitarians
4. In services limited to one or more fields, such as, industrial sanitarians, housing, insect, and rodent control, etc.

Group B—Sanitary Laboratory Technicians.
- a. in health departments
- b. in water purification plants
- c. in sewage treatment plants
- d. in stream pollution laboratories
- e. in milk or food laboratories—production or quality control.

Group C—Training Officers in Field Training Centers operated by federal state, or local health departments.

EMPLOYMENT OPPORTUNITIES FOR GRADUATES

I. *Official Agencies*
- A. Federal
  - 1. Public Health Service
    - a. milk sanitarians
    - b. food sanitarians
    - c. field agents in insect and rodent control
    - d. field agents in industrial hygiene
    - e. training officers
    - f. laboratory analysts
  - 2. Food and Drug Administration
    - a. field agents
    - b. laboratory analysts
  - 3. Department of Agriculture
- B. State
  - 1. State Department of Health
    - a. general sanitarians (sanitary officers)
    - b. milk sanitarians
    - c. food sanitarians
    - d. technical assistants for stream pollution or industrial waste investigations
    - e. laboratory analysts and technicians
    - f. field training officers
  - 2. State Department of Agriculture
    - a. field agents
    - b. laboratory analysts
- C. Local
  - 1. Health Departments
    - a. general sanitarians
    - b. milk sanitarians
    - c. food sanitarians

d. field agents in housing or other specialized activity
e. laboratory analysts
2. Public Works Departments
a. water plant operators
b. sewage plant operators

II. *Industry*
A. Factories
a. general sanitarians
b. industrial hygiene sanitarian
c. food sanitarian
B. Milk Plants
a. milk sanitarians
b. laboratory analysts
C. Restaurant, Restaurant Chains or Associations
a. general sanitarian
b. food sanitarian
D. Public Transportation Companies
a. general sanitarians

III. *Educational Institutions*
a. general sanitarians

It is recognized that there are many schools which are in a position to offer at least a portion of the proposed curriculum, particularly in the field of General Education. Inability to provide adequate training in the "Concentration Program" and acceptable field training facilities will tend only to defeat the purpose aimed at. For that reason the committee is sincere in appending this statement regarding institutional requirements.

INSTITUTIONAL FACILITIES REQUIRED

Institutions planning or actually engaged in this type of instruction should provide a staff adequately qualified by education and experience to teach the public applications of the basic sciences upon which this entire program is built. Such institutions should be able to make available adequate funds, provide well equipped laboratories, classrooms and library facilities, and an approved field demonstration area. This committee visualizes that it would be extremely difficult for schools other than universities and the larger colleges to develop such a program with depth in resources and personnel essential to success.

It is the hope of the committee that this report will aid in the development of sound educational facilities and the supplying of acceptably trained personnel for a field of employment currently embarrassed by a "labor shortage."

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Water Supply*

Engineering Section

THE 1949 report of this committee was devoted largely to a review of methemoglobinemia based upon a nation-wide questionnaire. This report was published in the *Year Book* of the Association, May, 1950. This year the committee circularized state and territorial departments of health regarding this subject and also regarding water supply aspects of civil defense, the fluoridation of water supplies, and the practice of free residual chlorination.

METHEMOGLOBINEMIA

The current survey of the committee relative to this subject disclosed no additional information which would permit conclusions which were more definite than those expressed last year. Only two recent cases were reported for 38 states, one in Indiana and one in Texas, which were associated with waters containing 80 to 100 p.p.m. and 13 p.p.m. nitrate nitrogen, respectively. It is very evident, therefore, that research is necessary to determine with certainty the safe concentration of nitrates in potable waters fed infants, and also what physiological factors underlie the observed fact that many waters having high nitrate content have been fed infants without methemeglobinemia developing.

FLUORIDATION OF PUBLIC WATER SUPPLIES

The research project of water fluoridation at Newburgh, N. Y., was reported upon in the June, 1950, issue of the *American Journal of Public Health*. Indirect information pertaining to similar research projects at Grand Rapids, Mich., and Brantford, Ontario, and as to subsequent demonstrations elsewhere has disclosed that the benefits anticipated by proponents of water fluoridation are beginning to be realized even during the first few years that treatment has been practised and that no undesirable effects nor technical difficulties have presented themselves. These favorable developments have resulted in the preparation of policy statements toward water fluoridation by the American Water Works Association, the State and Territorial Dental Health Directors,† and by a number of state dental associations which support properly supervised water fluoridation.

Nineteen of 38 state departments of health reporting have developed statements of policy which indicate that the fluoridation of a specific public water supply will be approved by the department when there is definite local support of the treatment process by dental and medical groups and official agencies and when satisfactory technical control is assured. Six departments are now considering the adoption of a similar policy. Only one department reporting has in-

† Subsequent to the preparation of this report, additional policy statements favoring fluoridation of public water supplies have been adopted by the American Dental Association, American Public Health Association, and the Conference of State and Territorial Health Officers. See *A.J.P.H.*, p. 1590, Dec., 1950, for the A.P.H.A. statement.

* COMMITTEE ON WATER SUPPLY.
Organized 1922. Published Reports: *A.J.P.H.*, Sept., 1924, Apr., 1925, Feb., 1926, July, 1927, Apr., 1928, Feb., 1929, May, 1930, *Year Books* 1930–1931, 1931–1932, 1932–1933, 1934–1935, 1937–1938, 1939–1940, 1940–1941, 1941–1942, *A.J.P.H.*, July, 1945, May, 1947, Feb., 1948, *Year Books*, 1948–1949, 1949–1950.

dicated opposition to so-called medication of potable waters. The present attitude of the majority of the reporting departments is in contrast to the more conservative policy generally followed in the past of restricting approval to individual cases when research programs were underway and where a cautious attitude was adopted pending the development of pertinent results of such research.

The Wisconsin Health Department has developed the most liberal policy in advocating the general, routine fluoridation of public water supplies. As a result, 31 of 44 supplies now being fluoridated in the 38 states reporting are located in Wisconsin, and 12 of about 25 communities where the treatment is under consideration are located in that state. Independent records show that the total number of supplies being fluoridated may be as high as 77.

It is evident, therefore, that a more favorable attitude toward water fluoridation is crystalizing throughout most of the country.

CIVIL DEFENSE

It is uncertain at this time just how urgent civil defense is, but the programs of the National Security Resources Board and of various state civil defense councils or commissions support the need for definite planning to meet the present unsettled international conditions. Health departments are confronted with problems of medical defense that are unprecedented in magnitude and complexity. Many aspects of medical defense involve environmental sanitation problems which are beyond the scope of this report.

The Committee on Water Supply, however, wishes to draw special attention to the need of reactivating mutual aid water service programs which were generally followed during the second World War. Information received from 38 state departments of health disclosed that programs are under development in 23 states. The programs in several states are much further advanced than in others.

This committee lacks definite information as to many aspects of possible atomic bombing and as to the interpretation of highly technical data in terms of practical administrative procedures which would serve to guide those obligated to serve safe potable water supplies during and after atomic bombing. It is hoped that these uncertainties will be clarified in the near future. It is possible at this time, however, to conclude that present planning may be based upon the following factors:

Atomic bombing apparently would be restricted to a relatively few important target areas. An atom bomb would completely destroy an appreciable area and would partly destroy a surrounding zone having a considerably larger area. This is in contract to many small-sized damaged areas which would result from the use of a large number of explosive and incendiary bombs.

Problems of civil defense during and following an atom bombing probably would be beyond the resources of even the largest municipality. Therefore, local planning alone will not suffice but mutual aid and mobile support must be arranged on a regional and state basis, with due regard to interstate coöperation by neighboring states.

The indications are that an air burst would be the type of atomic explosion utilized by an enemy because of the major damage resulting therefrom. The available information is to the effect that with an air burst hydrants would be destroyed within a radius of about one-half mile and that buildings would be destroyed within a radius of one to one and one-half miles. The service connections of the destroyed buildings and the damaged hydrants would waste large volumes of water.

A major problem of local water supply

officials, therefore, will be to isolate the water distribution system in the destroyed and seriously damaged area through the prompt closing of appropriate valves in a way which will minimize the loss of water and yet maintain water service for fire protection in the bordering zone. The public also must coöperate by closing valves on house connections whenever advanced warnings of a possible bombing makes this feasible. Unless this is done, the loss of water will materially exceed the capacity of supply conduits, pumping stations, etc., and fire will destroy an area much larger than that initially destroyed by the bomb.

Concern has been expressed as to the radioactive contamination of drinking water. The intensity of fall out of radioactive materials probably would be small in a high air burst on a clear day, with winds of carrying velocity. Any contamination of surface water sources which may occur under these conditions would be reduced subsequently by dilution in the water and by decay during the flow time from this source to the consumer's faucet. The intensity of contamination of surface supplies and of their contributing watersheds would be substantially greater on days when precipitation occurs or when other meteorological conditions are unfavorable to atmospheric dilution of radioactive materials released by a bomb burst. In any case, sources of water supply should be checked following the explosion of an atomic bomb by monitoring teams to detect the presence and character of excessive amounts of radioactivity. If radioactivity is present, rechecks should be made so long as contamination continues. This is especially true of terminal reservoirs connected directly to distribution systems.

Research to date indicates that water purification processes, such as chemical coagulation, flocculation, sedimentation, and filtration are quite effective in the removal of radioactive contamination from water. Radioactive materials become attached to suspended matter in water because of their properties and, therefore, within limits, their removal by sedimentation is possible. During periods of "turn-over" in reservoirs, however, dependence of sedimentation for the decontamination of water would be unreliable.

The storage of surface waters which are used without subsequent purification would serve to permit radioactive decay. Knowledge as to the flow-through time in such reservoirs should serve as a guide. The proper operation of intakes and the use of water in storage make it possible in many cases for water works operators to by-pass for limited periods contaminated water which otherwise might enter the distribution system.

Ground water supplies are very much less likely to be seriously contaminated by radioactive materials from bomb bursts, unless the ground water is stored in open reservoirs, in which case it should be checked for radioactivity as with surface supplies.

Chlorination of water will not affect its degree of radioactivity. The knowledge is not available at this time as to the extent to which radioactive substances will become attached to concrete, wood, or metallic surfaces in structures and piping containing radioactive water. Dependence, therefore, cannot be based upon such a possibility.

The underwater explosion of an atomic bomb in a reservoir would create very serious hazards. If the reservoir is not destroyed, the stored water should not be used for domestic purposes until such time as the extent of contamination has been determined and the effectiveness of decontamination methods have been evaluated. If it is absolutely necessary to use heavily contaminated water for fire fighting purposes, all citizens should be warned not to use the water for domestic purposes.

A ground burst with the accompanying earthquake shock would destroy water mains and other structures throughout an ill-defined area and also could lead to the scattering of radioactive soil over an appreciable area. A water burst in a harbor would be less destructive to the shore line but would lead to the distribution of radioactive droplets and mist over an appreciable radius of perhaps several miles, disregarding the effect of any wind.

Local water supply officials will need trained and planned assistance of monitoring teams and extensive equipment in determining what areas are safe for repair crews, what water supplies are contaminated to a dangerous extent, and when contaminated supplies may be safe for use after radioactive decay has occurred.

Detailed planning on the local level is necessary to permit water supplies being used for fire protection whether or not they are safe for potable purposes and to provide separate potable supplies for temporary use when necessary.

No official information is available as to the likelihood of highly radioactive material being spread in powdered form by an enemy nor as to the likelihood of biologic warfare being practiced. One gathers, however, that chief stress is being placed on potential atomic bombing.

The prevention of sabotage is of basic importance both to protect waterworks structures from damage and also to minimize the opportunities for supplies being contaminated with toxic materials or pathogenic organisms.

FREE RESIDUAL CHLORINATION

Past reports of this committee have dealt at considerable length with the technical aspects of free residual chlorination. The advantages of this improved chlorination procedure have been discussed extensively in the literature. These advantages may be summarized as far superior and more rapid disinfection, increased filter runs, the stabilization of deposited sludge in sedimentation basins, more effective control of tastes and odors, improved precipitation of iron and manganese, especially at low pH values, color removal by bleaching action, the maintenance of pipe capacity through the destruction of pipe growths and the control of algae growths.

In spite of these marked advantages, especially the possibility of securing very rapid and certain disinfection of water, this committee realized that free residual chlorination was not being utilized as extensively as desirable. Inasmuch as effective disinfection is a prerequisite during periods of emergency, it was deemed desirable to secure more definite information as to the extent of the practice in the respective states and territories. To date, replies from 38 state departments of health indicate that free residual chlorination is being practiced to a significant extent in only 15 states, and extensively in about 5 states.

Years ago, superchlorination or breakpoint chlorination was practised primarily to secure freedom from chlorinous taste. The information furnished this committee indicates that at present the process is being used primarily to secure more effective disinfection.

One gathers that the "flash test" is used generally for control purposes and that only limited use is being made of the more precise but more cumbersome orthotolidine arsenite test.

One seldom encounters an instance in sanitation practice where a contribution of the importance of free residual chlorination, receiving widespread technical support, has been adopted so slowly in practice. This situation prevails in spite of the fact that the only requirement for free residual chlorination is the use of somewhat higher doses of chlorine than otherwise would be necessary; no additional, expensive equipment being needed.

It is believed that one reason for the delay in adopting the practice of free residual chlorination is the fear that many water works operators have of chlorinous taste in the delivered water. Experience has shown, however, that free residual chlorination usually results in the elimination of chlorinous taste, although there is a transition period when taste difficulties may occur while free residual chlorine destroys the slime on the inner surfaces of distribution systems and forms taste-producing compounds.

This committee advocates that free residual chlorination be more extensively supported, and that the process be accepted as standard practice in the disinfection of most public water supplies so that improved disinfection can be assured under routine conditions, as well as during periods of emergency when possible sabotage or the practice of biologic warfare must be considered.

TRACE ELEMENTS

The committee has reappraised the role of trace elements in potable waters in view of the disclosures as to the importance of small concentrations of fluorides and nitrates and the probable importance of the sodium content of potable waters, to mention only a few constituents. It has been concluded that the committee should be in position to continue to review current developments as disclosed by technical literature, but that it is not in position to engage in original research of the type required to secure definite information as to the physiological effects of the many trace elements in potable waters.

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Chemicals Introduced in Foods*

Food and Nutrition Section

DURING the year 1950 considerable progress was made in the direction of providing more adequate control over the use of chemicals in foods, in the interest of public health, and regardless of whether the chemicals are added purposely, for functional reasons in food processing, or occur as contaminants or residues of pesticides used in the production or processing of foods. The previous report of the committee published in the *Year Book* [1] attracted much attention. Of considerable influence was the Resolution recommended by the committee, approved by the Food and Nutrition Section, and adopted by the Association at the 1949 meeting in New York.[2] This Resolution embodied a definite recommendation—that legislation be enacted to require scientific approval of chemical additives to foods prior to their use—by a major scientific organization of the country. The Food and Nutrition Board of the National Research Council, at its May, 1950, meeting, voted to establish a standing Committee on Food Protection, with a full-time secretary. Subsequently, a committee was formed, composed of leaders in various scientific fields, to advise the chemical and food industries, as well as government agencies whenever called upon to do so, on questions pertaining to the health aspects of chemicals in foods. The 81st U.S. Congress adopted a Resolution [3] to investigate chemical additives to foods, as well as related subjects. Pursuant thereto, a Select Committee was established and hearings were begun during September, 1950. These hearings, which were held both in Washington and in Chicago, were terminated in December and the committee later presented a report to the House of Representatives and recommended the continuation of its activities.

The members of the House Congressional Committee were:

James J. Delaney, Chairman
Thomas G. Abernethy
E. H. Hedrick
Paul C. Jones
Frank B. Keefe
Gordon L. McDonough
A. L. Miller

Mr. Vincent A. Kleinfeld was appointed counsel to the committee. The objectives of the committee as stated in the Resolution were as follows:

"The Committee is authorized and directed to conduct a full and complete investigation and study of (1) the nature, extent, and effect of the use of chemicals, compounds, and synthetics in the production, processing, preparation, and packaging of food products to determine the effect of the use of such chemicals, compounds, and synthetics (a) upon the health and welfare of the Nation and (b) upon the stability and well-being of our agricultural economy; (2) the nature, extent, and effect of the use of pesticides and insecticides with respect to food and food products, particularly the effect of such use of pesticides and insecticides upon the health and welfare of the consumer by reason of toxic residues remaining on such food and food products as a result of such use; and (3) the nature, effect and extent of the use of chemicals, compounds, and synthetics in the manufacture of fertilizer, particularly the effect of such use of chemicals, compounds, and synthetics upon (A) the con-

* Report of the Committee.
COMMITTEE ON CHEMICALS INTRODUCED IN FOODS.
Organized 1948. Published Report *Year Book* 1949–1950.

dition of the soil as a result of the use of such fertilizer, (B) the quantity and quality of the vegetation growing from such soil, (C) the health of animals consuming such vegetation, (D) the quantity and quality of food produced from such soil, and (E) the public health and welfare generally."

At the opening sessions of these hearings of the Delaney Committee the Resolution adopted by the American Public Health Association was presented, and discussed by the chairman of the present committee, on authorization of the Executive Secretary, Reginald M. Atwater, M.D.

Competent observers were of the opinion that the evidence presented by the Delaney House Committee was very likely to result in recommendations for an addition to the Food Chapter of the Food, Drug and Cosmetic Act of 1938, to require advance consideration and approval prior to use of all new chemical additives to foods.

In the field of research and investigation mention should be made of the findings of investigators (4) of the Food and Drug Administration that two synthetic sweetening agents used for many years as substitutes for sugar in certain therapeutic diets, or in special foods for diabetics, were likely to prove deleterious on long continued use. These sweetening agents were Dulcin (p-phenetylurea) and P-4000 (l-n-propoxy 2 - amino-4-nitrobenzene). As a result of these studies the chemical and pharmaceutical industries were advised that these synthetic sweetening agents would no longer be permitted to be used, and a statement of policy to that effect was published in the *Federal Register*.[5] Chronic toxicity studies on saccharin and on sodium cyclohexyl sulfamate showed these sweetening agents to be relatively non-toxic.

During the year also some reports of independent investigations, both in Europe and in the United States, have indicated the need for more intensive study of synthetic coal-tar dyes used in artificial coloring of foods. The certification of these artificial coloring agents is provided by the present Food, Drug and Cosmetic Act so that prompt action in the protection of public health is possible, whenever the need should arise.

During the year an important hearing was conducted under the provision of the Food, Drug and Cosmetic Act, to receive evidence that would permit the establishment of tolerances for residues of pesticides used in or on fresh fruits and vegetables. Under the food-standard-making provisions of the Act a definition and standard of identity for mayonnaise and salad dressings[6] was adopted. A proposed standard for bread and related products was also promulgated.[7]

In both the completed action for salad dressings and in the proposed standards for breads certain chemicals which had been proposed as ingredients of these foods were not included, because in the opinion of the Administrator evidence of their harmlessness was not convincing, or for other reasons their inclusion was not considered to have been justified.

Only a limited number of food products, however, have been defined under the standard making provisions of the Food, Drug and Cosmetic Act since the revised law was enacted in 1938. Adequate scientific control of additives to unstandardized foods still remained as a health problem to be solved at the end of the year. Considerable progress, however, had been made.

The present committee is continuing its study of the progress being made over the control of chemicals in the food supply, with the view of providing a detailed report for the information of public health workers at a later date.

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Theobald Smith: First Chairman of the Laboratory Section, 1900*

Laboratory Section

IN his address as chairman of the Laboratory Section in 1950, Dr. Edsall reëxamined "the work of the public health laboratory . . . its origins, its functions, and its ultimate place in our coördinated society,"[1] particularly in relation to the same subject as treated in the address of the first chairman of the Section, Dr. Theobald Smith, in 1900.[2] Your archivist has also been moved to recall something of the work of the first chairman, being urged to this decision, however, by a different set of circumstances. At the dinner in New York in October, 1949, commemorating the fiftieth anniversary of the founding of the Section,[3] Dr. Herbert D. Pease, Recorder, 1900–1911 (and whose death on February 14, 1950, is noted here with sorrow), offered to deposit in the archives further material from his files on persons and events associated with the early days of the Section. Dr. Pease seems to have had that rare ability as Recorder to recognize the historic significance of present occasions. I spent several hours with Dr. Pease on the following day and brought away many original letters. They include handwritten letters from Dr. Theobald Smith; a handwritten letter on a personal matter from Dr. Walter Reed; and several communications from Dr. James Carroll, who was elected chairman 1906, but who died in September, 1907, before assuming office. As you know, the preliminary report of Walter Reed with Carroll, Agramonte, and Lazear, on *The etiology of yellow fever* was presented to the Association at Indianapolis in 1900, the same meeting at which Dr. Smith addressed the new Section on Bacteriology and Chemistry. Dr. Pease recalled those days so vividly that I felt I must report to you at the next meeting, not so much as keeper of the records, but more, perhaps, as historian. That was the first circumstance. The second occurred during the past summer.

In my office there is framed a facsimile of the letter Dr. Smith wrote in October, 1933, to Dr. Edward B. Krumbhaar, now Professor Emeritus of Pathology, University of Pennsylvania School of Medicine, recording certain attitudes which had guided his research.[4] A companion piece is a photograph of Dr. Smith taken in the garden of his home about 1933 and given to Dr. Wadsworth by Dr. Smith's daughter, Dr. Dorothea Smith. This letter and photograph are continually examined and read with interest and enthusiasm, particularly by visitors from other countries. This summer a visitor from Australia in great admiration asked, "*Who* was Theobald Smith?" And so, today, "Who *was* Theobald Smith?"

Conventionally, one begins with the formalities of birthplace and early education, but since Dr. Smith is now generally remembered only in his later years, I thought you might first be interested to compare that memory with the impression of Dr. William Bullock, Emeritus Professor of Bacteriology, University of London, on his first meeting

* Report of the Archivist.

with Dr. Smith at the London Hospital in 1923, when Dr. Smith was 64 years old. "I found him quite unlike what I had imagined. A tall, thin, ascetic looking man completely unenglish in type, and all the time I felt I was conversing with Abraham Lincoln."[5] Dr. Bullock said further, in an obituary notice of Dr. Smith as a member of the Pathological Society of Great Britain and Ireland, "He was admittedly the greatest bacteriologist produced by the United States of America. For fifty years his work was continuous and meritorious. His numerous discoveries, many of them of a fundamental nature, entitle him to rank alongside the greatest masters of bacteriology. He was the contemporary of many of the founders of the science. . . . It is certain that America in days to come will look on him with that veneration with which France cherishes the name of Pasteur and Germany that of Robert Koch."

With, then, that impression of his personality and that accolade to his career, it may be stated that Theobald Smith was born July 31, 1859, in Albany, N. Y., and died in New York City on December 10, 1934. In 1881 he received the degree of Bachelor of Philosophy from Cornell University and in 1883 the degree of Doctor of Medicine from the Albany Medical College. He was thus, at the beginning of his career, in a most exciting period of bacteriological development; Koch publishing his work on the tubercle bacillus in 1882; and Pasteur's work on rabies being climaxed in the first preventive treatment in man in 1885. The practical point of view was a prevailing one. While Dr. Smith did not share it as a necessarily immediate objective, his first opportunity in investigative research was the result of a practical need. At that time the country was faced with appalling losses due to diseases of swine and the mysterious Texas fever of cattle. Dr. Daniel Elmer Salmon, known now in connection with *Salmonella*, had been called to head the newly established United States Bureau of Animal Industry in 1883, and he appealed to Dr. Simon H. Gage, Professor of Histology and Embryology at Cornell University, an instructor and lifelong intimate friend of Dr. Smith, for a trained assistant to aid him in solving the problem of diseases that were concerning the animal industry. Theobald Smith was the graduate of greatest promise. Dr. Gage has written: "He knew German and French almost as well as English; physics, chemistry, and mathematics seemed native to him. Most important of all, he was a born researcher with a keenness of insight that promised great things. He was tireless . . . and possessed the rare quality of honesty that never deceives itself."[6]

Theobald Smith joined the staff of the U. S. Bureau of Animal Industry at the age of 24 and was shortly made director of the pathological laboratory. A little later he became associated with the teaching staff of the School of Medicine of the university now known as The George Washington University, and from 1886 to 1895 held what is believed to be the first chair of bacteriology in a medical school in America.[7] The second period in Dr. Smith's career was 1895–1915. He went to Boston in 1895 as Director of the Pathological Laboratory of the Massachusetts State Board of Health. In the same period, from 1896, he was Professor of Comparative Pathology at Harvard University. The third period is 1915–1929, as Director of the Department of Plant and Animal Pathology in the Rockefeller Institute for Medical Research, Princeton, N. J.; and, subsequently, until his death in 1934, as Director Emeritus.

1884–1895. Dr. Smith was not one of the many Americans who went to Europe to study under the noted bacteriologists and pathologists of the period; it is said, for lack of means. Instead, he was self-taught at home, devising at the same

time technics of his own, and how profitably! Equipped with this technical facility he began at once to publish such studies as those on fluid and gelatinous media for bacteria (1883); a method of staining tubercle bacilli (1885); the bacterial flora of Potomac River water (1885). But these were outside the primary demands in the Bureau of Animal Industry; namely, hog cholera, swine plague, blackhead of turkeys, Texas fever of cattle, abortion in mares, and bovine tuberculosis. Bullock makes tribute to Smith's keen observation; in the course of his work on swine erysipelas, he noted that when guinea pigs were fed with cereals without any grass or succulent vegetables, they died within four to six weeks of a peculiar disease chiefly recognizable as subcutaneous extravasations of blood. "This account of a 'peculiar disease' is the very earliest reference to the experimental production of scurvy. . . ."[5] The work of Salmon and Smith in hog cholera was the basis of methods later established to protect man against cholera, typhoid, and plague.

In 1884 Dr. Smith wrote, "We shall soon attack that still unsolved mystery of Texas fever." And nine years later, in 1893, there was published as *Bulletin No. 1* of the United States Department of Agriculture, Bureau of Animal Industry, the now classic study by Theobald Smith and his veterinary assistant, F. L. Kilbourne, *Investigations into the nature, causation, and prevention of southern cattle fever.* It established the first experimental proof that a protozoan disease can be transmitted by a blood-sucking arthropod, "No ticks, no Texas fever." Bruce's work on trypanosomes came in 1894–1895; and malaria and yellow fever studies still later. Dr. Smith's powers of work have been reported by his associates as phenomenal; and he was known as candid, diligent, accurate, inventive, imaginative, conscientious.[8] His own words confirm these estimates of his friends. In a letter to Professor Gage on the Texas cattle studies, dated December 21, 1933, he wrote,

"You see that after it had been shown that the disease failed without the ticks, everything was still to be done. Nothing was known of the nature of the disease, whether it was a liver or intestinal or septicemic disease. However, the very first case gave me the clue. . . . To say that a protozoan parasite passes from old to young ticks through the egg, and then into the mouth parts required some proof before it would be accepted at that time. The entire work fell on me as every case had to be blood examined and the corpuscles counted. The final experiment of breeding the young ticks from the eggs and putting them on the cattle I did myself. It required four years of slavery at the microscope, at autopsy, at watching tick broods, at the long labor of preparing the report."[6]

Theobald Smith was under 35 years of age when, as he said, "the long labor of preparing the report" was undertaken. But even then he "appears as an expert morbid anatomist, microscopist, hematologist, epidemiologist, and experimenter, and his monograph will still repay perusal and might well be reissued as a text book to show how scientific work should be done." * [5]

It has interest for this Section that the results of this historic work were presented to the American Public Health Association on October 23, 1889, at a meeting in Brooklyn and published in the Proceedings for that year, *Preliminary observations on the microörganism of Texas fever.* The full report in *Bulletin No. 1* of the Bureau of Animal Diseases was not published until 1893.

Dr. Edsall has read from Dr. Smith's address to the Section in 1900. Dr. Smith also said on that occasion,

"I have already classified our work as consisting of investigation, and routine work

* The reports on "Investigations into the nature, causation, and prevention of southern cattle fever" and on "A comparative study of bovine tubercle bacilli and of human bacilli from sputum" are reproduced in *Medical Classics*, Emerson Crosby Kelly, Editor.[9]

created by investigation. Let us briefly examine these two kinds of work, so intimately associated with one another. Of the two I unhesitatingly put the investigation first, as the soil on which the practical work may properly develop and bear fruit. We as a body need, above all things, to emphasize the importance of research and the desirability of having proper provisions made for it. The diagnostic, analytic and executive work we know will continue to flourish and it may eventually conceal and obscure entirely the soil on which it lives, and which needs continual enriching and tilling in order that there may be fruit as well as foliage."[2]

And years later in 1933, the year before his death he wrote,

"What is one man's meat is another's poison in research as in other vocations. Temperament goes far towards deciding our course. In the three different environments in which I have spent my active life I have always taken up the problems that lay spread out before me in the new environment, chiefly because of the easy accessibility of material without which research cannot go on; for in the early years material and resources were exceedingly scant and this meagerness determined the direction and scope of all research."[4]

1895–1915. The Washington period was succeeded by what has been called the Boston period, and new fields of investigation were explored. Between 1895 and 1915 Dr. Smith was Director of the Pathological Laboratory of the Massachusetts State Board of Health and was in charge of the production of antitoxins. (The laboratory of the State of Massachusetts appears to have been the first state laboratory established for the production of antitoxin, in 1894.) The splendid bibliography of Dr. Smith's works compiled by McKinley and Acree [10] lists more than 250 publications, beginning in 1883, and shows some 14 papers on diphtheria early in this Boston period; all with new, and some with fundamental contributions. In 1895 "antitoxin production was in its infancy and its secrets were closely kept, chiefly in Behring's Institute in Marburg."[5] Smith, however, did independent experimental work on immunity in diphtheria and on the administration of toxin-antitoxin that was the basis for the immunizing procedures in man as developed and applied by William H. Park and others from 1913 on. This application of another of his fundamental studies in immunity to the benefit of mankind is in the familiar pattern of Dr. Smith's researches, especially if noted in the light of his retrospective letter to Dr. Krumbhaar in 1933:

"My interest in a problem usually lagged when certain results could be clearly formulated or practically applied. To continue and analyze still further every link of the established chain either failed to hold my interest or was made difficult or impossible for causes lying outside the problem. As I look back it is precisely these links that have provided innumerable problems to others. Each link has grown into a chain and the end of successive chain making is not in sight."

An incidental observation during his researches in diphtheria, comparable in character to that first experimental production of scurvy in guinea pigs in 1897 during his studies on swine erysipelas, was that guinea pigs that had survived a dose of diphtheria toxin-antitoxin died if sometime later they were injected with horse serum. Dr. Smith told Ehrlich of this observation in 1904 and later Otto in Ehrlich's laboratory showed that the condition was serum anaphylaxis and called it the "Theobald Smith Phenomenon."

An instance of Dr. Smith's immediate participation in every phase of his investigations is illustrated in this letter of January 12, 1896:

"Today President Eliot drove over from Cambridge to speak to me (i.e., about the plan for a department of pathology for Harvard) and met me coming from the Bussey Institute where I had been examining my antitoxin guinea pigs, as they are precious when they continue to smile as if to say, 'Your antitoxin pulled me through.'"[6]

In 1896 Dr. Smith published the first accurate differentiation between the bovine and human types of the tubercle

bacillus. And this was acknowledged by Koch in 1908 at the Washington meeting of the International Tuberculosis Congress when he said, "To Dr. Theobald Smith, of Harvard, belongs the credit of having been the first to call attention to certain differences between the tubercle bacilli found in man and in cattle. It was his work which induced me to take up this same study."[6] Koch had not made this acknowledgment at the Congress in London in 1901, and Dr. Smith's work was at that time overshadowed. One admires Smith's dignity and reserve and reads, perhaps with new meaning, from his letter of 1933, "It is not profitable to enter into controversies, especially with those working in another geographic area or continent unless the material on which their researches are based has been examined."

Specific and fundamental bacteriological investigations were also accomplished in the Washington-Boston periods; in particular, studies on the biology of the colon-typhoid group. Dr. Smith was among the first to note chemical differences in related or identical bacteria. As early as 1889 he showed that *B. coli* ferments glucose with gas production whereas *Bact. typhosum* does not. At the meeting of the Laboratory Section in 1905 in Boston, Dr. Smith presented with Herbert R. Brown and Ernest L. Walker *The fermentation tube in the study of anaerobic bacteria with special reference to gas production and the use of milk as a culture medium* [11]; and before the Association as a whole he presented a paper as the George Fabyan Professor of Comparative Pathology on *The relation of animal life to human disease*.[12] The paper on *The fermentation tube* . . . was published first in the *Journal of Medical Research* and later in the Proceedings of the Association. A letter of October 10, 1905, given to the archives last year by Dr. Pease, explains this; and illustrates too why he was known as candid, conscientious:

"I have finally decided to have our paper published in the *Journ. Med. Research*. My reasons for this I have already given you in part, but I may again state them. 1. I did not know of any binding agreement, as I have not attended meetings since Indianapolis and the paper would not have been offered at the meeting if I had known it. 2. There are two younger men whose names are assoc. with me and in their interest I think it best to publish without restriction. If the paper were mine alone I might care less about it. 3. The understanding with the other journal is not mutually binding and therefore unsatisfactory. I am sorry to take this course against your wishes but it was the course I had in mind when writing the paper and I did not know that any other would not be agreeable."

At the first meeting of the Section in 1900, the significance of *B. coli* in water supplies was already the subject of much discussion, and there is in the archives a letter to Dr. Mickle from Dr. Pease of March 14, 1935, saying, "The Indianapolis meeting was noted for the discussion on the significance of *B. coli* in water supplies. I can see Dr. Peter Bryce, then of Toronto, trying to force Dr. Smith to tell of some bacteriological method which would certainly classify safe from unsafe waters by the *B. coli* test which Dr. Smith had developed several years earlier (Smith fermentation tube system) while working on the waters of the Mohawk and Hudson Rivers above Albany."

Well established as it is, this work of Smith on *B. coli* is even now sometimes overlooked. For example, I was interested to see in a publication (1945) by Vahlne [13] from the Bacteriological Institute of the University of Lund on *Serologic typing of the colon bacteria* a subsequent correction:

"After this was printed I realized that the above historical review might give rise to some misunderstanding. It will be appropriate, I think, therefore, to mention that the works reported by Kauffmann [1941–1945] as well as by Knipschildt [1945] were carried out without any knowledge of the papers published by Theobald Smith et al. [1927] and Julianelle [1926–1938]. As a matter of fact, I was not aware myself of the two papers in question

till the greater part of my experiments were concluded."

Again, I cannot refrain quoting from Dr. Smith's letter of 1933, "We must not be discouraged if the products of our labor are not read or even known to exist."

In parallel with Dr. Smith's activities in the laboratory of the Massachusetts Board of Health, he was gradually building up the subject of comparative pathology at Harvard. Dr. Tyzzer has written of this period, "It is probably rather unusual for the medical student as he studies the subjects of anatomy, physiology, pathology, etc., to realize what they are all about, but those who, at the old school on Exeter Street, took Theobald Smith's optional course in *The comparative pathology of infectious diseases* could scarcely fail to see the light. The disjointed subjects which they had been studying suddenly fell into place and for the first time a conception of disease as a whole dawned upon the mind."[14]

1915–1934. From Boston Dr. Smith went to New York to become Director of the Department of Plant and Animal Pathology of the Rockefeller Institute and here the flower of his lifelong interest in parasitism and disease blossomed[15]; only an examination of his bibliography will show how profusely. Dr. Prudden wrote at that time:

> "As the eye ranges over the stately bibliography which marks these years of Dr. Smith's scientific activities, it rests upon many titles with stories in them, of a period or a halting point, in the growing knowledge of disease and its incitants, upon which the author's wide range of thought . . . has cast helpful and inspiring light."[16]

And, again, Dr. Prudden:

> "Though long in the foremost rank of the notables of science in America, the work of Professor Smith has not often secured, or suffered, popular exposition. But he has had the uncommon satisfaction of seeing, many times, the lines of thought and research which he has opened up lead sooner or later to far-reaching theoretical development and practical achievements."[16]

"Public honors arrived for him rather late, but then they came with a rush."[5] The American Public Health Association awarded Dr. Smith the Sedgwick Medal in 1930. But Theobald Smith was a philosopher—"The joy of research must be found in doing since every other harvest is uncertain and even the prizes do not always go to the discoveries to which we would assign them."[4] He was also a man of humility—"As I travel to and from the laboratory, I meditate on how little I know about the things I am working on." And a man of quiet humor. When wrestling with the deadly pig disease he says in a letter of March 16, 1886, "I don't wonder as I gaze fondly at the squealing, upturned faces of our pigs that human beings could worship so good a thing as an ox! You cannot imagine what a storehouse of knowledge pigs are. Full of interesting parasites of all kinds, and plenty of all colored bacteria. Noble animal, I am overcome!"[6] And again to Dr. Simon Gage, in 1899 a suggestion for an address to be given at the American Association for the Advancement of Science, "Take a nice general subject such as parasitism vs. Tammany, or protective inoculation vs. political venality and trace the relationship between leucocytosis and hoboism as illustration of the biological and sociological ills."[6] And in another letter to Dr. Pease, January 2, 1900, "I was about to send my regrets at not seeing you before I left New Haven when your letter came. I feel myself to blame for leaving so hurriedly. However, the meetings of societies seem to end this way usually. It seems as if the members became charged with explosive material which scattered them unceremoniously."

In this report I have borrowed liberally and literally from the writings of those who knew Dr. Theobald Smith and who are competent to evaluate his life and work. But even so, it is only a

pointer to the original sources which alone can answer the question, "*Who* was Theobald Smith?"

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Research and Evaluation Projects In the Field of Health Education*

Public Health Education Section

IN May and June, 1950, the Committee on Research and Evaluation sponsored a survey of health agencies, both public and private, to gather information about research and evaluation projects in the field of health education. The purposes for gathering the information were twofold:

1. The committee wished to determine the number, kinds, and location of individuals or agencies conducting health education research.
2. The committee wished to make available to professional health education personnel information on research projects which might be applicable to their specific job responsibilities.

The survey plan was determined after committee members were polled on possible procedures for accumulating research information.

The sixteen active members of the committee were rather arbitrarily assigned areas of the country to survey. A form letter was sent to each committee so that there would be uniformity in the request made for data. The form letter suggested twelve " types of studies appropriate to report."

Persons in thirty-seven states and the District of Columbia responded to the request for information. Many of these responses, of course, were to report that there were no known research projects under way or recently completed in the state which could be fitted into any of the twelve " types of studies appropriate to report." Some of the responses gave too little information to type the studies listed.

Thirty-four studies were classified for purposes of this report. In analysis, the studies were divided into the twelve types studied originally listed in the letter requesting information. A typical study will be cited from each of the twelve types. The types are as follows:

1. Measuring the amount of accurate information the public has on certain health problems—for example, what percentage of the public can name the seven common symptoms of cancer?

Denver Tuberculosis Society study on community knowledge of tuberculosis in three sections: school quiz, adult quiz, and University of Denver study. In the school and adult quizzes information tabulated will indicate the effectiveness of a two year educational program when present results are compared with those received when the program was initiated. Person in charge is Joseph Staton, Director of Health Education, Denver Tuberculosis Society, 314 14th St., Denver, Colo.

2. Determining attitudes on the part of the public toward health problems and programs. House-to-house canvass to determine public opinion about immunization and medical supervision of infants and preschool children. This survey is being done with professional guidance. Person in charge: Lucile B. Graves, Dane County Supervising Nurse, 353 West Johnson St., Madison, Wis.

3. Determining the understanding the public has of health activities, service and educational, public and voluntary, in a certain locality—for example, what percentage of the public understands the services available from a local health department? To what extent is intelligent use being made of these services?

* Sponsored by Committee on Research and Evaluation.
Organized 1949.

Spot sampling of the state, through state health department district offices, to determine knowledge of rural people of public health services and medical care in the state. Person in charge: Dr. Harold Smith, Dept. of Sociology, Purdue University, Lafayette, Ind.

4. Determining the order of importance in which the public would rank current health problems—for example, would the public rank cancer first, heart disease second, and so on?

There were no reported studies in this area.

5. Determining the kinds of health service which the public feels should be added to present health services—for example, do the majority of mothers want a community well baby clinic established?

There were no reported studies in this area.

6. Research on the effectiveness of specific media—for example, public reactions to a county fair exhibit.

Study on the use of "Pierre the Pelican," mental health leaflet series for parents of first-born children. Developed by the Louisiana State Mental Health Society, the twelve pamphlets are being sent to two hundred families. Two hundred other families will serve as a control group. The study will determine the effectiveness of direct mail health information, using a piece of literature which should be of interest to the group receiving it. A standardized questionnaire, to be used by the public health nurse, will discover amount of information gained by families receiving pamphlet, compared with those not receiving it. Person in Charge: Lila M. Atkinson, Health Educator, County of Ventura Health Department, 684 Buena Vista St., P. O. Box 491, Ventura, Calif.

7. Determining the relative effectiveness of various media in influencing behavior—for example, radio vs. newspaper.

Bureau of Public Health Education and Bureau of Records and Statistics coöperated in this study which was to determine the effectiveness of several groups of printed materials currently employed by official and voluntary agencies. These materials were given to the parents of students in several hygiene classes at Hunter College. The parents of other students were used as a control group. A questionnaire survey will measure materials effectiveness. Person in charge: Dr. Beatrice Konheim, Department of Health, 125 Worth Street, New York, N. Y.

8. Determining scope of activities of a total community health education program.

There were no reported studies in this area.

9. Studying the total effectiveness of an organized community-wide educational program in health.

Rat-control program in Dayton, Ohio, in 1949 made use of school children who served as home inspectors in a census of the rat problem. Full promotional activities through schools, adult groups, press and radio stimulated enthusiasm of the children. A follow-up survey is now being conducted to measure effectiveness of the total program. Person in charge: George W. Watson, Health Educator, Department of Public Welfare, Dayton, Ohio.

10. Using pre-testing techniques in development of educational materials in health.

National Foundation for Infantile Paralysis, in preparing a revision of "Message to Parents," arranged for canvass of parents of 5,000 school children in Schenectady, N. Y. Questionnaire distributed through children contained copy of original "Message to Parents." Returned questionnaires served as basis for revision. Person in charge: Sally Lucas Jean, R.N., Director of Health Education, National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York, N. Y.

11. Determining the effectiveness of group techniques in health education—for example, lecture versus discussion methods, group participation in community problem solving versus autocratic planning.

There were no reported studies in this area.

12. Research on the opinion of professional health personnel as to priorities in community health education program.

There were no reported studies in this area.

Schools-		*Vol.-*	*Vol.-*	
Official	*Official*	*Off.*	*School*	*Vol.*
12	6	7	5	4

Of the thirty-four studies reported, ten were of the first type—measuring public information. The second type, which determines attitudes toward health problems and programs, accounted for six studies. Only one study was reported of the third type of study—determining understanding public has of health activities. The sixth type—research on effectiveness of specific media—was second in total number with nine studies. Both the seventh type, determining effectiveness of compared media, and the ninth type, studying total effectiveness of an organized community-wide health program, accounted for three studies each. Two projects of the tenth type, using pre-testing techniques in developing materials, were reported.

Seven of the thirty-four projects were done or are being done coöperatively by voluntary and official health officials. School systems and voluntary agencies shared responsibility for five projects while twelve official agencies worked with school systems on research problems. Only ten of the projects were done by official and voluntary agencies working individually with the general public.

CONCLUSIONS

1. Most interest is being shown in research projects which measure the amount of accurate information the public has on certain health problems as well as the public's attitudes toward these problems. Such research points toward sounder program planning, coming closer to meeting measured needs of the public.

2. Public and voluntary health agencies are jointly planning research studies that will help to eliminate overlapping and duplication.

3. School systems are coöperating with voluntary and official agencies on research projects, not only in school health but in broader aspects of community health.

STATES RESPONDING TO SURVEY

Alabama	Nevada
Arizona	New Jersey
California	New Mexico
Colorado	New York
Connecticut	North Carolina
Delaware	North Dakota
Florida	Ohio
Georgia	Oregon
Idaho	Pennsylvania
Illinois	Rhode Island
Indiana	South Carolina
Kentucky	South Dakota
Maine	Utah
Maryland	Vermont
Massachusetts	Washington
Michigan	West Virginia
Minnesota	Wisconsin
Montana	Wyoming
Nebraska	

Appendix

TYPES OF STUDIES REPORTED *

1. Measuring the amount of accurate information the public has on certain health problems—for example, what percentage of the public can name the seven common symptoms of cancer?

Tuberculosis—two questionnaire studies (school quiz and adult quiz) and University of Denver study, on community knowledge of the disease. Joseph Staton, Director of Health Education, Denver Tuberculosis Society, 314 14th St., Denver, Colo.

Tuberculosis—to determine knowledge sanatoria patients have of their disease measure effectiveness of a planned educational program. Fred. D. de Armond, Public Health Educator, County of Santa Clara Health Department, Hall of Justice, San Jose, Calif.

Nutrition—survey of teen-agers. Edith Lantz, New Mexico A and M College, State College, N. M.

Human Growth—pre-test knowledge of school children. Mrs. Richard B. Ellis, Health Educator, Richland County Health Department, Columbia, S. C.

Tuberculosis—survey of community on knowledge of disease. Elizabeth Davis, Health Educator, Sumter County Health Department, Sumter, S. C.

Teacher Training—survey of colleges to determine how well potential teachers realize responsibility in protecting sight of children. Marjorie Young, Consultant in Education, Na-

* Research Studies Reported to the Committee.

tional Society for Prevention of Blindness, 1790 Broadway, New York, N. Y.

Tuberculosis—knowledge of public during mass x-ray survey. Vivian Drenckhahn, National Tuberculosis Association, 1790 Broadway, New York, N. Y. (2 separate studies).

Tuberculosis—sampling survey in community on knowledge of the disease. Dr. Charles K. Kincaid, Health Commissioner, Department of Public Health, 112 North Hamilton, Madison, Wis.

Immunization Status—survey of knowledge of students of immunization. Dr. Kincaid (above).

2. Determining attitudes on the part of the public toward health problems and programs.

Student Health Interests—evaluation of health interests of high school students (Byrd evaluation plan). Eleanor Fletcher, Health Education Consultant, Oregon State Board of Health, 1022 W. 11th Ave., Portland, Ore.

Professional Meeting—questionnaire evaluation of annual meeting of Colorado Public Health Association. Norma Johannis, Director, Public Health Education Section, Colorado State Department of Public Health, State Office Building, Denver, Colo.

Cancer—survey of attitudes of people in whom cancer is diagnosed or suspected who delay in seeking treatment, as compared with those people who do not delay. Beryl Roberts, Associate in Health Education, School of Public Health, Harvard University, 55 Shattuck St., Boston, Mass.

Dental Health—community survey concerned with student and parent attitudes toward dental health. Barbara Kahn, Health Educator, Seattle-King County Health Department, City-County Building, Seattle, Wash.

Hot Lunch Program—local survey of attitudes toward such a program. R. M. Parry, D.V.M., president, Barron County Health Council, Almena, Wis.

Immunization and Medical Supervision of Children—house-to-house canvass to measure public opinion on these programs. Lucile B. Graves, Dan County Supervising Nurse, 353 West Johnson St., Madison, Wis.

3. Determining the understanding the public has of health activities, service and educational, public and voluntary, in a certain locality—for example, what percentage of the public understands the services available from a local health department? To what extent is intelligent use being made of these services?

Rural Health Services—sampling of state to determine knowledge public has of rural health services. Dr. Harold Smith, Sociologist, Purdue University, Lafayette, Ind.

4. Determining the order of importance in which the public would rank current health problems—for example, would the public rank cancer first, heart disease second, and so on?

No reported studies of this type.

5. Determining the kinds of health service which the public feels should be added to present health services—for example, do the majority of mothers want a community well baby clinic established?

No reported studies of this type.

6. Research on the effectiveness of specific media—for example, public reaction to a county fair exhibit.

Testing Related Materials—reaction to exhibit, measuring proper grade levels for filmstrips, testing pamphlet materials for readability. Vivian Drenckhahn, National Tuberculosis Association, 1790 Broadway, New York, N. Y.

Nutrition—community reaction to variety of materials for broad health education programs in the field. Eleanor Fletcher, Health Education Consultant, Oregon State Board of Health, 1022 W. 11th Ave., Portland, Ore.

Social Hygiene Education—testing of reaction to "Human Growth" and "Human Beginning," sound films, E. C. Brown Trust, Education Center Building, 220 S.W. Alder, Portland, Ore.

Infant Care—control study on effectiveness of series of twelve pamphlets. Lila M. Atkinson, Health Educator, County of Ventura Health Department, 684 Buena Vista St., P. O. Box 491, Ventura, Calif.

Health Bulletin—subscriber reactions to health bulletins measured by postcard questionnaire. Irving Shapiro, Health Insurance Plan of Greater New York, 425 Avenue of the Americas, New York, N. Y.

Diabetes—determination of which of three health education techniques is most effective to find unknown diabetics. Marguerite Green, Keenan Health Center, 3200 North 36th Street, Milwaukee, Wis.

Health Films—evaluation of reactions to the use of public health films. William Dewey,

Wisconsin State Board of Health, State Office Building, Madison, Wis.

Health Films—determination of extent to which health behavior can be favorably influenced by improved instruction through the use of selected health films and filmstrips in rural elementary schools. Ralph Kuhli, Director, Division of Health Education, Wisconsin State Board of Health, Madison, Wis.

Health Films—evaluation of health and safety education films. Warren Southworth, Dr.P.H., Associate Professor of Health Education, School of Education, University of Wisconsin, Madison, Wis.

7. Determining the relative effectiveness of various media in influencing behavior —for example, radio vs. newspaper.

Rodent Control—controlled study of effectiveness of variety of materials used during general community education program. Dr. George Rosen, Department of Health, City of New York, 125 Worth St., New York, N. Y.

Official and Voluntary Agency Materials—controlled measure of effectiveness of materials, based on evaluations made by parents of Hunter College students. Dr. Rosen (see above).

Audio-Visual Aids in Tuberculosis—survey of tuberculosis society secretaries to evaluate aids. Alice C. Kemp, Chairman, Reading Tuberculosis Association, 120 North 5th St., Reading, Pa.

8. Determining scope and activities of a total community health education program.

No reported studies of this type.

9. Studying the total effectiveness of an organized community-wide educational program in health.

Rat Control—follow-up survey of community-wide program in rat control, using school children as home inspectors. Survey measuring public knowledge of program. George Watson, Health Educator, Department of Public Welfare, Dayton, Ohio.

Venereal Diseases—telephone survey by volunteers to question listeners about VD radio series. Marion J. Bryant, Chief, Bureau of Public Health Education, San Diego Health Department, Civic Center, San Diego, Calif.

Tuberculosis—follow-up questionnaire to find out how mass x-ray survey could be improved. John McCarthy, Los Angeles County X-ray Survey Foundation, 333 West 2nd St., Los Angeles, Calif.

10. Using pre-testing techniques in development of educational materials in health.

Poliomyelitis—canvass of parents of school children to revise pamphlet. Sally Lucas Jean, R.N., Director of Health Education, National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York, N. Y.

Tuberculosis—rough-draft pre-test materials to be used in Negro schools. Mrs. D. McL. McDonald Executive Secretary, 1208 Ball Street, Columbia, S. C.

11. Determining the effectiveness of group techniques in health education—for example, lecture versus discussion method, group participation in community problem solving versus autocratic planning.

No reported studies of this type.

12. Research on the opinion of professional health personnel as to priorities in community health education programs.

No reported studies of this type.

(Information was limited on the reports of many of these studies. Classification of these studies, then, is necessarily rough and probably inaccurate in some cases.)

RUTH E. GROUT, Ph.D., School of Public Health, University of Minnesota, Minneapolis, Minn., *Chairman*

ANDIE L. KNUTSON, Ph.D., Chief Experimental and Evaluation Service Branch, Division of Public Health Education, U. S. Public Health Service, Washington, D.C., *Co-Chairman*

WALLACE FULTON, Community Health Consultant, Minnesota Department of Health, University Campus, Minneapolis, Minn., *Secretary*

Salaries for Health Education Personnel

Public Health Education Section

THE Subcommitte on Salary for Health Education Personnel, Alfred K. George, M.D., Chairman, submitted its report at the Seventy-eighth Annual Meeting. The title of the report is "Outline on Present Needs for More Adequate Remuneration in the Field of Public Health Education." The principal topics discussed are:

The Importance of Adequate Salaries in the Field of Public Health Education.

Recommendation of Increased Levels of Minimum Starting Salaries for 6 Grades of Positions for Community Health Educators and for 5 Grades of Positions for Health Education Media Personnel.

Qualification Requirements and Provisions for Substitution of Qualification Requirements.

Illustrative tables and charts are presented.

This report is the third submitted by the subcommittee and as was done last year, has been mimeographed. Copies can be obtained from Dr. George, University of Cincinnati College of Medicine, Cincinnati 19, Ohio.

The Subcommittee on Salary for Health Education Personnel is part of the Public Health Education Section Committee on Planning for Health Education. Ann W. Haynes is the Chairman.

School Health Record*

School Health Section

AT the request of Dr. Southworth, I accepted chairmanship of the Committee on School Health Records. The committee was established "to survey the types of health records now used and the purpose they serve, and to recommend improved records and procedures for their effective use." Since it was obvious that this rather broad mission could not be accomplished during the summer months, the chairman limited the program of the committee to basic topics, which will be discussed later, with the thought that the broader problems relating to school health records would be proper topics for discussion at this meeting.

The following accepted membership on the committee:

Hazel D. O'Neal, Health Coördinator,
Office of the Superintendent of Public Instruction,
Springfield, Ill.

Jessie M. Bierman, M.D.,
Professor of Maternal and Child Health,
University of California,
Berkeley, Calif.

Claire A. Christman, M.D.,
1800 North Edison Street,
School Health Department,
Arlington, Va.

Morey R. Fields, Ed.D.,
School of Education, New York University

Harold Jacobziner, M.D.,
Chief of Elementary and Junior High School Health Services,
New York City Department of Health

Albert D. Kaiser, M.D.
Health Bureau,
44 West Marshall Street,
Rochester, N. Y.

Charles L. Maxwell, M.D.,
Division of Health Service,
Eastern Illinois State College,
Charleston, Ill.

Ruth Taylor,
Consultant for School Health,
Bureau of Nursing,
New York City Department of Health

The chairman asked each member to prepare a statement concerning the following:

(a) Basic purpose for maintaining a school health record.

(b) Basic information to be included in a school health record.

In addition, to give opinion as to the relative merits of the single medical record and the double medical record, that is, medical record plus pupil health card.

Statements were received from each member of the committee on these subjects and, after going over them, I have briefly summarized common points contained in the six reports received.

It is interesting to note that although there was no communication between the various members on these topics, their opinions were remarkably similar. They were in agreement that the basic purpose of maintaining a school health record is to have cumulative information on the health aspects of the school child in order to give continuing intelligent health supervision on an individual basis. There were individual variations on this general statement which seemed to be depending upon whether a committee member was a physician or an educator. In addition, it was pointed out that not only must the medical record serve the basic purpose mentioned above but that it could be useful in—

* Report of the Committee.

(a) analyzing and evaluating the school health program; (b) assisting the teacher in understanding the child and in developing her ability to observe health deviations; (c) providing a useful link between the home, school, and the community.

With respect to the question of what basic information should be included in a school health record, there was a variety of opinions, but when looked at carefully each committee member included identical items, the variation being more in detail rather than in difference of opinion. I shall quote from one of them which, although brief, is very concise. It is as follows:

Basic information to be included in a school health record

1. Information identifying the individual
2. Family history
3. Personal history
4. Results of the medical examination
5. Results of any special tests or examinations
6. Summary of findings significant to the school
7. Recommendations to the school
8. Recommendations to the home
9. Indications of the follow-through process

I assume that the member in this instance meant by "personal history" not only personal medical history but immunization history also.

With respect to the question of the merits of the single versus the double medical record, five members of the committee were in favor of the double record for various reasons, whereas one did not feel that it was possible to point out the merit of either single or double record. While the majority were in favor of the double record, there were various qualifications to the statements given and it appears to me that these might well be a topic for discussion at this open meeting.

The whole subject of school medical records brings many questions to mind, some of which must be answered on a purely local basis, whereas others seem to have general interest. For example, one may inquire "in whose hands should the school medical record be retained?" Should it always be in the hands of the school nurse, who may get to the school infrequently, or with the principal, who is the ultimately responsible person in the school?

How confidential can school medical records be kept?

How much medical information which appears on a medical record should be given to a school teacher?

How long should school medical records be kept?

How can useful information concerning the child's health at school be obtained from private physicians?

How important is the form of the medical record?

If it may be assumed that it has space for basic information, such as described above, does it make much difference as to form? It has been my experience that the most important part of the school medical record is the person who makes it out and uses it. Records, however brilliant in conception, do not serve a useful purpose unless persons using them understand and record on them conscientiously.

REPORT OF COMMITTEE ON SCHOOL HEALTH RECORDS

The group discussed the basic purposes of a school health record and, while there was general agreeement with the committee's ideas on this, it was at once apparent that the form and content of the record, as well as the method of use, would vary widely. What might be suitable in one locality would be impractical in another.

Among the more important factors influencing the form and application of school health records, the following may be mentioned:

1. General aims of the school health program.
2. Amount of medical and nursing service available.

3. Frequency of examination.
4. Extent of teacher participation.
5. Geographical—whether School Health Service is rural or urban.
6. Availability of ancillary medical services.
7. Administrative responsibility, i.e., by Board of Education, Department of Health, or other.
8. Method of record transfer.
9. Parent participation in school health program.

Single Health Record versus Double Health Record

Considerable discussion arose as to the value of the single and double health record plans. One group found the double system working very satisfactorily, while another had discarded it in favor of a new type of single record. Opinion was expressed from one quarter that the single medical record included as part of the scholastic record worked out well. It appeared that the degree to which the classroom teacher is brought into the health program and the extent to which formal teacher-nurse conferences are developed determine, in some measure, the success of the double health record plan. It was interesting to note that in some programs a single health record is maintained at the school and an additional card file, or roster, is kept by the nurse to facilitate her follow-up work on pupils. In some cases the single health record is held by the nurse, who visits the school again following a doctor session to follow up with the classroom teacher on children with health problems. Her health record file serves as a basis for home visits also. In other instances the health card remains with the classroom teacher in a separate file, or is included in the scholastic record. This latter plan raises the speculation as to how and where to record medical information of a confidential nature, of no use to the teacher in her health observation of the child, but which could do him harm if accidentally disclosed.

Types of Health Records

As was to be expected, the records described differed widely in form from simple 3 x 5 cards, with check listings for physical defects, to the more elaborate type with space provided for additional entries, such as psychological scoring, medical specialist consultations, guidance counseling, etc. By and large, the forms used were the result of experimentation and were said to suit the needs of the particular school health service in which they were used.

The question of establishing uniform school health records on a state or county level was mentioned. In a limited experience it was found that such forms were usable in the county rural areas, but were not acceptable in large urban communities having well established school health services. From the discussion reported above it appears that uniformity of records is not a desirable feature, programs differing as they do, and would be very difficult to achieve in any event.

On the whole, the open sessions on school health records were well received. The groups attending them actively participated in the discussions, and the presentation and exchange of ideas on this topic served as a stimulus to the Committee on Records, as well as to the group, for further study in this subject.

ROBERT W. CULBERT, M.D.,
New York City Health Department, New York, N. Y., *Chairman*

American Public Health Association

Statement of Income and Expense

January 1 to December 31, 1950
(with some interpretation)

The Association has two types of income, designated as "General" and "Earmarked." Somewhat over one-half of the total income in 1950 was from "General Income" including membership dues, which are available for the operation of the basic services of the Association. In 1950 "General Income" exceeded expenses by $5,402.26. The allocation of "General Income" is the responsibility of the Executive Board.

The rest of the Association income is "Earmarked," since it is accepted for specific projects by the Executive Board and must be expended for the purposes given, under the Board's supervision.

The custodian of all Association funds and properties is the Treasurer. Income from all sources is deposited to the account of the Treasurer and can be withdrawn only upon his signature.

This statement is published at the request of the Executive Board for the information of the membership.

General Income and Expense Covered by It

	Income	*Expense*
Income from Membership Dues (all classes)	$ 98,227.14	
Expense charged against dues income: Rent, maintenance, library service, Sections and Branches; travel of Executive Board and Executive Secretary; membership maintenance and promotion; public relations; auditor; rebates to affiliated societies; staff salaries		$117,303.81
Income from *American Journal of Public Health*	65,711.34	
Expense charged against *Journal* income: Printing, paper, cuts, mailing; salaries of Editorial staff; Editorial Board travel		73,945.97
Income from Association Publications	57,890.98	
Expense charged against publications income: Printing and distribution; discounts to dealers; share of proceeds to collaborating agencies; salaries		36,736.23
Income from Annual Meeting (all sources)	39,480.22	
Expense charged against Annual Meeting income: Exhibit costs; rental fees; Program Committee and staff travel; programs and registration supplies; promotion		25,719.31
Income from Field Studies	1,907.02	
Income from Miscellaneous Sources (Interest on securities, discounts for cash on accounts payable, etc.)	9,876.39	
Expense—Committee on Research and Standards: Travel; supplies; salaries		4,290.09
Expense—Committee on Professional Education Including Vocational Counseling and Accreditation: Committee travel; consultation fees; printing and supplies; staff salaries		9,695.42
Total non-earmarked income and expense	$273,093.09	$267,690.83

EXPENSE COVERED BY EARMARKED INCOME

(Income from grants is identical with expense for each project; unexpended balances are segregated and held over for expenditure in 1951)

	Income	*Expense*
Committee on Administrative Practice ..... Studies and surveys in state and local health administration; research on evaluation practice; Health Practice Indices		$ 27,531.93
Subcommittee on Medical Care ..... Research and studies on methods of administering medical care		26,020.36
Evaluation of Administrative Practice ..... Studies of procedural methods in the control of such diseases as pertussis, endemic goiter and typhoid fever		4,057.25
Subcommittee on Local Health Units ..... Coöperative program with the National Health Council in developing local activity for adequate health services		8,500.39
Accreditation of Field Training Areas		7,487.81
Subcommittee on Hygiene of Housing ..... Studies and promulgation of principles of and standards for healthful housing		9,191.53
Merit System Service ..... Preparation of materials for examination of candidates for public health positions; development of examinations for American Board of Preventive Medicine and Public Health and for Division of Commissioned Officers of the Public Health Service		79,649.37*
Merit System Field Service ..... Field consultation in use of examinations and on problems of personnel administration		19,111.14
Engineering Section Project ..... Research in administration of environmental sanitation programs; consultation on curricula; personnel placement		37,573.45
Inter-Association Committee on Health		56.00
Lasker Awards ..... Processing of data on candidates and recipients		7,045.51
Association Committee on Child Health ..... Compilation of standards; study of possible use of health department facilities for training of physicians		14,788.81
Total Earmarked Income and Expense	$241,013.55	$241,013.55
GRAND TOTAL OF INCOME AND EXPENSE	$514,106.64	$508,704.38

* Includes fees for service.

PART II OF AMERICAN JOURNAL OF PUBLIC HEALTH
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Methods in Public Health Research

PROCEEDINGS OF A CONFERENCE HELD UNDER THE AUSPICES OF THE PUBLIC HEALTH STUDY SECTION, NATIONAL INSTITUTES OF HEALTH, IN CONJUNCTION WITH THE GRADUATE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF PITTSBURGH, IN STEPHEN FOSTER MEMORIAL, PITTSBURGH, PA., MAY 10–11, 1950

LOWELL J. REED, SC.D., *Conference Chairman*

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FOREWORD

Analysis and evaluation of methods used in conducting research investigations yield fully as fruitful results as the findings of the studies themselves. The Conference on Methods in Public Health Research, held in Pittsburgh in May 1950, is therefore a significant contribution to research in the health problems of man and may mark the beginning of periodic discussions designed to perfect the tools and procedures used in health studies and to broaden their application.

The Public Health Study Section deserves special commendation for its sponsorship of this means of providing information on the scope and methods of projects that have received grants from the Public Health Service and affording a stimulus to potential applicants for research grants in this field. Credit should go also to the Division of Public Health Methods which worked closely with the Public Health Study Section and the Graduate School of Public Health of the University of Pittsburgh in planning the Conference and in outlining the scope and content of the topics for presentation and discussion.

At the Conference, a group of outstanding investigators, many with long and varied experience in public health research, presented or discussed papers dealing solely with the methodology used in several current or recently completed studies. The discussion centered on the difficulties encountered and, in many instances, stressed improvements dictated from the vantage point of hindsight.

These papers, and the critiques by those who had reviewed the papers in advance of the meeting, are published in this volume. The summary which introduces the papers highlights the methodological principles brought out in the general discussion. The summary also includes a guide that outlines the criteria suggested to test the adequacy of study techniques and planning.

The *Proceedings of the Conference on Methods in Public Health Research* should prove of value to those who are planning studies in the field of public health. It is with this belief that this publication is made available to a larger group of investigators than could have participated in the meetings.

LEONARD A. SCHEELE, M.D.
Surgeon General

PREFACE

The Graduate School of Public Health of the University of Pittsburgh is honored that the Public Health Study Section should have held its first discussion conference on study methods here in our institution. The acceptance of our offer to serve as host to the Conference on Methods in Public Health Research and as joint sponsor of the Conference represents both a challenge and a trust. We are eager to accept the one and warrant the other in our own right through the studies which our school expects to make of the familial, environmental, and other social factors that influence health.

The papers and discussion presented in this volume clarify many of the difficult methodological problems that face us in our attempt to analyze the health resources of the communities in which people live and the effect of social and economic factors on the health of population groups. The Conference, recognizing the present gaps in our knowledge and the difficulties in studying these complex relationships, has nevertheless pointed the way toward more effective criteria for sound investigations. That recognition and the development of those criteria give promise of increasingly exact and significant studies in the future.

THOMAS PARRAN, M.D., Dean
Graduate School of Public Health,
The University of Pittsburgh

An Evaluation of Study Methods—A Summary*

ANTONIO CIOCCO, Sc.D., AND MARTHA D. RING

Department of Biostatistics, Graduate School of Public Health, University of Pittsburgh; and Division of Public Health Methods, United States Public Health Service, Washington, D. C.

PITTSBURGH MEETING OF PUBLIC HEALTH STUDY SECTION

SOME 70 persons concerned with investigations in various aspects of public health met May 10 and 11, 1950, in Pittsburgh, Pa., at the invitation of the Public Health Study Section of the Public Health Service, and the Graduate School of Public Health, University of Pittsburgh. They met to analyze and evaluate methods used in public health research as presented by three groups of investigators conducting studies of (*a*) community health problems; (*b*) diagnostic and therapeutic techniques; and (*c*) long-term trends in morbidity and related phenomena. One of the purposes of the meeting was to provide both the members of the Study Section and prospective applicants for research grants with a consensus of criteria to guide in the formulation and appraisal of applications.

On the basis of critiques and general discussion of the methodology used in 10 studies in these 3 fields, the conferees were asked to analyze the basic principles illustrated and to establish criteria which could serve as guides in planning future research of similar types. The emphasis of the Conference was on methodology in studies of individuals, population groups, and social organizations—studies that cannot be conducted in the rigidly controlled environment of a laboratory.

To give the general framework of the Conference, this review summarizes points brought out in the papers and discussions, indicating the range in objectives, scope, study techniques, and methodological problems which they illustrated. It concludes with an analysis of essentials that need careful definition, selection, and evaluation to assure the maximum validity of results in any study among groups of people. The principles and standards developed during the Conference are of particular significance since they represent the results of a first attempt at group analysis of public health studies and surveys on grounds of methodology alone.

METHODS IN EVALUATION OF COMMUNITY HEALTH PROBLEMS

The four papers in this group illustrate a wide diversity of objectives, techniques, and scope. The first describes the sponsorship, organization, procedures, and content of a Nationwide survey of the health services received by children. The second gives the details of a study to determine the contribution a medical school can make in improving the medical care provided by physicians in a rural area. The third describes the use of opinion-poll techniques to evaluate the effectiveness of efforts in health education. The fourth

* Appeared under the title of "Pittsburgh Meeting of Public Health Study Section—An Evaluation of Study Methods," *Public Health Reports*, Vol. 66, pp. 883–897, July 13, 1951.

analyzes the objectives and procedures of administrative studies of the health needs of a community.

1. Methodology in a Survey of Pediatric Services, by John P. Hubbard and Maryland Y. Pennell.
2. Evaluation of the Extension of Medical School Services to Rural Areas, by Roscoe L. Pullen.
3. Evaluation of Health Education Activities by Opinion-Poll Techniques, by Oscar J. Kaplan.
4. Surveying Community Needs, by Ira V. Hiscock.

The Nation-Wide Study of Child Health Services

One part of an ambitious survey, which included the field of pediatrics education, had two objectives: (1) To collect data that would have more local meaning than could averages for the whole country or a State, and (2) to stimulate the interest of practicing physicians and community health agencies in the provision of more adequate child health services.

The sponsorship of Federal, State, and local groups was essential to both objectives. The study was an almost unprecedented effort to reach all parts of the continental United States and Hawaii under decentralized procedures that were planned and guided to obtain as much uniformity and consistency of results as possible, considering the entire character of the project. Adjustment factors were worked out in detail in an additional sample study to correct for bias that would result from basing the findings for private practice solely on the data furnished by physicians who replied to mail questionnaires.

A major question raised in the discussion of the study related to the decision to attempt 100 per cent Nation-wide coverage—a costly undertaking that could not actually be achieved—rather than to plan for a series of sample studies that could have been subjected to intensive follow-up. The reply indicated that a sample basis was discarded because of the wish to stimulate participation in all States and localities. More than half the States have prepared reports on their health services, and the findings are already being used in recommendations for improvement based on local knowledge of conditions and deficiencies. The statistical value of the data collected has admittedly not been enhanced by the decision to attempt complete coverage, but the enthusiasm and interest created by that attempt have gone a long way toward furthering the study's objectives.

The pediatrics study made no attempt to measure the volume of health services received by children in terms of any standard of adequacy. Presentation of the data was limited to analysis of variations in services among regions, States, and county groups. Standards have been left for later determination by the Pediatrics Committee for the Improvement of Child Health. The State reports will reveal the extent to which the physicians of the State recognize the inadequacy of local services.

Extension of Medical School Services to Rural Areas

This project is designed to ascertain the extent to which the Tulane University Medical School could provide consultant and ancillary services to rural counties which lacked medical facilities and an adequate number of physicians. Like the pediatrics study, and many other types of investigation of community health problems, the Tulane project includes motivation of people as a major objective.

Accurate evaluation of the types of services that the medical school is attempting to provide for rural practitioners was cited as important in view of plans for regionalization of medical services elsewhere. In the discussion of this paper, attention was called to the danger of dual objectives in fact-finding

research, since the one objective may conflict with the other. To determine the success of the Tulane project, the discussion brought out, it is necessary not only to have a carefully controlled experiment but also to develop indices that will measure the quality of medical care before and after the practitioners use the medical school services. It was also queried whether the use of a questionnaire on which the physicians answer specific questions is an adequate method of obtaining data unless the data are checked by personal visits.

Answers to these queries indicated that some improvement in medical care could be noted in the increasing willingness of physicians to have Tulane staff members provide consultation in the hospital. Most of the physicians are aged 45 years or over and all have large patient loads. It has been impossible for them to keep abreast of medical education, and they need ancillary services to reduce the load they carry.

The questionnaire method of obtaining information was supplemented by personal visits to each physician, and some index of the physicians' qualifications was obtained in listing their medical education and training. The Tulane project, as planned, provided opportunity for collection of data in control counties, but the idea of controls was later abandoned. The project, nevertheless, gives some indication that the quality of medical care is improving in that the physicians now use the consultant and ancillary services provided by the medical school.

Opinion-Poll Techniques in Measuring Results of Health Education Activities

An attempt to measure the effect of health education campaigns and the relative usefulness of various media of communication is illustrated in the description of the purposes and methods of a project in San Diego, Calif. Questions were asked before and after an intensive health education campaign conducted by radio, press, and other media, to which both control and experimental groups were exposed. The experimental group received additional material by mail and other means.

As a discussion paper points out, the project shows how a specific technique of measuring attitudes and opinions can be brought to bear on many problems of immediate and practical importance. The project also indicates a method by which controlled experimentation can be carried out in field research on man. One of the first steps in such an undertaking is to perfect the tools of measurement—a step which forms the major part of the project in San Diego.

Surveying Community Needs

This paper, explaining the purpose and scope of community surveys, stresses the need to consider socioeconomic factors and relationships with reference to health problems and reviews criteria for measuring community needs. The paper outlines the historical development and validation of appraisal schedules for community health activities and gives special emphasis to methodological approaches in surveys of chronic illness, occupational health, and school programs. In describing the techniques of neighborhood studies, special attention is given to some of the important questions of purpose, cost, timeliness, and anticipated use of the survey.

As pointed out in the discussion of this paper, motivation of people is one of the main objectives of surveys of community needs—an objective illustrated in all four papers presented in this session of the Conference.

METHODS IN EVALUATION OF THE EFFECTIVENESS OF DIAGNOSTIC AND THERAPEUTIC TECHNIQUES

An important aspect of public health research methods is the analysis of the

results of various techniques of diagnosis and treatment and of the suitability of these techniques for widespread application. The three papers presented in the second session of the Conference deal with the methodology of studies to determine the effectiveness of nasopharyngeal irradiation on deafness, of influenza vaccination, and of tests for nutritional deficiency. They were followed by two discussion papers and by subsequent explanation of the reasons for choice of certain methods of study.

1. The Efficacy of Nasopharyngeal Irradiation for the Prevention of Deafness in Children, by William G. Hardy and John E. Bordley.

2. Plan for the Evaluation of Vaccination Against Influenza, by Thomas Francis, Jr.

3. Evaluation of Diagnostic and Therapeutic Tests for Nutritional Deficiency States, by Dorothy G. Wiehl.

Nasopharyngeal Irradiation for Prevention of Deafness

A study has been undertaken to determine whether children with impaired hearing and nasopharyngeal lymphoid tissue can be benefited by irradiation treatment and whether the treatment is suitable as a preventive public health measure. This paper gives details of the plan, the selection of children to be studied, the efforts to assure accuracy and validity of observations, the selection of and procedures used for control and treatment groups, and the special problems encountered.

Two reasons were given in the discussion for limiting the groups of children to those with both lymphoid tissue and hearing impairment. In the first place, since about three-fourths of all children in the age group studied have hyperplastic nasopharyngeal lymphoid tissue, some other limitation on selection would have been necessary to keep the numbers studied within manageable proportions. In the second place, the irradiation technique used is specific for lymphoid tissue but not for hearing. In addition, to reduce subjective factors, it was decided to use a screening technique (puretone audiometry) that an adequately trained field staff can utilize accurately. The 8 or 10 categories of lymphoid tissue are difficult to classify and not sufficiently standardized for objective screening. Practical considerations and the wish to pin screening down to a specific symptom dictated the decision to restrict the study to children with hearing impairment.

Subjectivity in the experiment is avoided by keeping those who give the irradiation treatment unaware of which children receive irradiation. The physician who records the results of the examinations of lymphoid tissue during the course of the study dictates the findings to a recorder without reference to records of previous findings.

The decision to cease withholding irradiation from any child in the control group if the child might benefit from the treatment has not yet been exercised. Parents were told that all children in the control and experimental group would receive periodic examination and that some would get treatment that might benefit them, though no predecision was made that the treatment would be beneficial. Most of the children in the study had subclinical conditions for which physicians would rarely be consulted. Children may be lost from both control and experimental groups when they go to clinics or physicians for treatment. Records are kept of any other treatment received by any of the children.

Evaluation of Vaccination Against Influenza

This paper gives a detailed account of the plan, organization, and procedures of a study to determine the effect of influenza vaccination on students in the Army Specialized Training Program in nine universities. Important in such studies are the homogeneity, stability, and size of the population to be studied,

adequate supplies of standardized vaccine to be administered, timing of the vaccination (since the duration of the effect of the vaccine is not known), uniformity of procedures, close observation by competent investigators, confirmation of diagnosis, and adequate controls.

In response to a question raised in a discussion paper regarding the preferability of a prison type of population in research of this character, the main objective of the study was explained as primarily an effort to determine whether influenza vaccination would be of value in a military population. It was therefore decided to choose a population having approximately the same age characteristics and living conditions as the military. Earlier studies had been set up in institutions, but it proved difficult to induce infection with safe materials.

Some correlation was found between vaccination and immunity. The plans for the investigation included study of antibody titers in the experimental group before immunization and in the control group before exposure. Variation in influenza strains presents one problem, and the fact that only 20 per cent of the people in the exposed control group get sick is another. No clear correlation is found between antibody level and susceptibility.

Evaluation of Tests for Nutritional States

The multiplicity of variables that must be analyzed and controlled in research on population groups is clearly indicated in this paper on methodology in studies of nutritional deficiency states. Diagnostic criteria must be valid, objective, clearly defined, and held constant. Comparability of "control" and "experimental" groups must be established initially and evaluated periodically in terms of age, sex, developmental stage, genetic and environmental factors, deficiency status, nondietary conditioning factors, and dietary factors.

The complexity of the problem is illustrated by the fact that more than 50 known nutrients have a potentially equal number of nutritional deficiency states. The signs of deficiency can be accurately observed through X-ray and clinical photography in some instances, but it is difficult to isolate signs of single, specific deficiencies.

Problems of study methods in this and in the two other papers presented in this session, as one of the discussion papers pointed out, derive from difficulties in determining the size of the sample to be studied; in grading the results of diagnosis to establish critical points dividing positive from negative diagnoses on a scale that runs all the way from true positive to true negative; and in providing the most sensitive, specific, and objective diagnostic tests possible.

METHODS IN LONG-TERM STUDIES

The three papers giving methodological details of studies that extend over long periods, even a generation or more, bring out many of the same questions of sampling, standardization of measuring tools and observations, and consideration of environmental and social factors that may affect the findings that were brought out in the discussions of the two other groups of studies.

The first paper in the series is on longitudinal studies of child health and development. The second describes the base for epidemiological studies of chronic illness in the matched population records of the Eastern Health District of Baltimore. The third is a description of methods used in recent long-term morbidity studies in Hagerstown, Maryland.

1. Certain Technical Aspects of Longitudinal Studies of Child Health and Development, by Harold C. Stuart and Robert B. Reed.

2. Matched Population Records in the Eastern Health District, Baltimore, Md.: A Base for Epidemiological Study of Chronic Disease, by W. Thurber Fales.

3. Recent Long-Term Morbidity Studies in

Hagerstown, Md., by Philip S. Lawrence and Clark Tibbitts.

Longitudinal Studies of Child Health and Development

The phase of this long-term project described is an attempt to measure the volumetric growth of subcutaneous tissue in a longitudinal section at the broadest part of the calf of the right leg. Since a high degree of correlation is found for volumetric growth of muscle, bone, and subcutaneous tissue, it is hoped that a method of combining observations on children can be developed to determine the relationships of illness and disabling conditions to growth patterns.

The study is still in progress, and the relation of the findings on growth to health raises difficult questions of defining positive health and it gradations. The effects of specific short-term illness are being noted, but in many instances are found to be only temporary. Constants for development have not been used as such, but it is hoped that the development of one tissue can be related to the development of another tissue to observe differences in rates of growth.

If sample cross sections of different age groups had been used for study instead of long-term measurement of the same children, it would have been possible to determine different stages of development at different ages. Valid indices, however, would have required very large numbers of children in each age group. Furthermore, the cross-section study would have shown nothing of individual development or of growth rates at different ages, the objective of the present study. Establishing a cumulative index of health and development is a serious part of the problem. Comparisons of rates of tissue growth and rates of short-term illness have not yet been made. Relationships of height and body weight are available and can eventually be compared with health records.

Matched Population Records for Study of Chronic Disease

This paper on studies in the Eastern Health District of Baltimore, Md., gives an account of the historical development, purposes, and uses of the census records maintained for families and their individual members in certain areas of Baltimore for a quarter century.

Discussion of this paper centered on the application of the method to other areas. An ideal plan would perhaps involve keeping a continuous register of all individuals and households. An unqualified "yes" was the response to the question whether, after 20 years' experience, the investigator would use census records rather than a continuous name file if the studies were started afresh. The censuses conducted every 3 years provide a close check on over-all population movements. Any substitute in the form of current files would be expensive and time-consuming and no matter how carefully maintained, would need periodic checks. The Baltimore experience has shown the difficulty of matching records from one census to another. The 1945 addition of information to the basic records to show the maiden name of the wife, date of marriage, and previous residence has aided the process of tracing people.

Discussion turned to the problems of obtaining accurate information on illness illustrated by the various studies conducted by the Public Health Service. Some data on illness in the Eastern Health District in Baltimore were taken from medical records in institutions. In the 5-year morbidity study in 1938–43 housewives gave information, and diagnoses were verified by clinics and attending physicians.

The frequency of interviews needed in a morbidity study depends on the type of information to be collected. In studying chronic illness, for example, prevalence data may be about as useful as

incidence data and are much easier to get. Prevalence of chronic illness measured by the number of cases disabling at a given time or at some time during a given period can be ascertained with fair accuracy by visits once a year, since the rates are not subject to much seasonal variation.

On the other hand, weekly or semimonthly visits are necessary to determine the incidence or prevalence of nondisabling acute illness, particularly for the minor respiratory diseases. Frequent visits, however, introduce problems of determining new cases as distinct from those that have carried over from a preceding period. More frequent visits increase the cost of the studies.

As a compromise, in a morbidity study on a broader scale, a new sample of households might be visited each month, and the prevalence of chronic illness recorded at each visit. In a year, such a study would furnish prevalence data for 12 times the number of households in each monthly sample. Accurate information on acute diseases could be recorded for the month preceding the visit, and the year's record would yield incidence data for acute conditions during 12 months which would roughly eliminate seasonal variations.

The difficulty of obtaining comparable data for, say, 10,000 individuals who are examined by several different physicians was indicated at this point. As to illness, it is easier to get comparable data in terms of disabling cases and those confined to bed, than for nondisabling cases. However, since chronic diseases are frequently nondisabling for long periods, it seems advisable to record at least this type of nondisabling illness. In the Baltimore survey "confined to house" was used as a more objective classification than "disabling," particularly in recording illness among children and adults who were not gainfully employed. The recorded "house cases" were of about the same frequency as "disabling cases," but the total number of days confined to house was considerably less than the total days of disability.

In this connection, the discussion stressed the need for health status studies so that data can be obtained for normal and well people also. The gap between clinical and public preventive medicine needs to be bridged by studies of large groups of people who undergo thorough clinical examinations which will reveal their health status. Answers to simple questions put by an investigator are not enough, nor is mass screening alone sufficient. Furthermore, all factors in the social environment that have a bearing on health should be correlated with health findings. We now rely too heavily on income data alone.

Long-Term Morbidity Studies in Hagerstown

The Hagerstown studies, initiated in 1921, have provided a wealth of data that form part of the permanent records which are being organized in a family file. This paper indicates some of the methodological problems in connection with collection and verification of reports on illness and the need for new techniques for reporting in longitudinal studies. The multiple screening examination and symptom check list, now in exploratory stages, merit study for this purpose. Problems of choosing the informant, of changes in the composition of the original population cohort, and of the intervals between observations were also stressed. Longitudinal studies offer great promise in obtaining information on the incidence and progress of chronic illness, the interrelation of illness and socioeconomic factors, and use and effectiveness of treatment programs. An essential for success is effective advance planning for the long-term period of study.

As pointed out in one of the discussion papers, long-term studies are ap-

parently here to stay. The session on this group of studies was characterized as, in itself, a complete justification for the Conference. Studies stimulated by the discussion of methodology should considerably narrow the gap in present knowledge of how to obtain valid and useful data in public health studies.

METHODOLOGICAL PRINCIPLES ILLUSTRATED

The range of public health research in communities and population groups is both broad and deep, as illustrated by the papers presented. A special committee appointed by the National Advisory Health Council has classified this research in five main groups:

1. Studies related to the extent and distribution of diseases or other public health problems in a community, population, or part of a population.
2. Studies, on a community, population, or group basis, in relation to the pathogenesis or dissemination of diseases of public health importance.
3. Studies of the effectiveness of prophylactic or therapeutic procedures on a community, population, or group basis.
4. Studies designed to test the significance of a laboratory or clinical finding, or to test the validity of a laboratory technique, on a community, population, or group basis in relation to problems of public health importance.
5. Studies in public health methods.

The last group is further subdivided into four categories:

(*a*) Studies designed to solve organizational and administrative problems faced by health agencies in the mass application of new methods of diagnosis, prevention, and control of diseases of public health importance, and in the application of new measures for the maintenance of health.

(*b*) Studies designed to test or develop epidemiological methodology, or other specialized methodology used or presumably useful in public health practice.

(*c*) Studies of the productivity of public health practices already in process.

(*d*) Studies of the applicability of theories and hypotheses in public health organization and administration.

The broad scope of this research has resulted from the great medical discoveries that have revealed the relationships between health and disease and biological and social environment. The field of inquiry includes, broadly, determination of health needs, of factors associated with illness, development and improvement of the means of meeting health needs, and methods of applying the knowledge public health possesses and will possess. It is clear from the breadth of the professional field of public health that its prime purpose is to study man, not only as an individual, but also in his social and economic setting.

The methodological principles illustrated in the papers presented, and some of the problems encountered in maintaining those principles, may be summarized under three heads: objectives, measurements, and controls. Following the discussion of these three points is an outline which evolved from the Conference as a check list for evaluation of the soundness of a research project in its advance planning.

Objectives

A clear formulation of objectives is recognized as an essential first step in planning investigations in public health. This step is needed (1) to make sure that the study meets a recognized need for information, (2) to assure that the data collected will provide that information, (3) to keep the projects within manageable proportions, and (4) to obtain the financial support and other backing that will enable the investigators to undertake and complete the job.

Several types of objectives can be identified in the papers presented at this conference. One objective is to increase scientific knowledge. Another is to learn the dimensions of a given problem or condition as a basis for social action. Another is to bring about social action as part of the study process. As the papers also indicate, a single project may have more than one objective.

Many include motivation of people as a major purpose, while at the same time the project is designed to measure the extent of need for social action. The major difficulties arise when one of these objectives complicates or defeats accomplishment of the other.

In this connection, it may not be amiss to distinguish between surveys with research objectives and those aimed at motivating changes in social behavior. When undertaken for purposes of research, a survey is designed solely to increase knowledge by discovering the relationship between two or more variables within a systematic frame of reference. Its findings are then universally applicable under the conditions described. On the other hand, when a survey is designed to motivate social action, the facts and relationships revealed are likely to be applicable only to a highly specific time, place, or other condition.

Measurements

Rules governing careful definitions of the problems of investigation and precision in the selection of instruments apply equally to all types of studies. The units of count used may range from inches and pounds in measuring height and weight to days in bed for measuring severity of illness. They may include counts of the number of pathological examinations as well as the number of questionnaire responses expressing specific attitudes or opinion on a given question. In the relatively new and ever broadening field of public health studies, pioneering is still in progress in developing valid units which will measure social and economic phenomena and illness.

Many of the observations recorded in these studies run the danger of being colored by subjective factors among observers. Moreover, many of the things to be measured are intangible. Training and instruction of observers, tests to take account of their individual differences, and reduction of procedures to the simplest and most concrete terms will help to counteract the handicaps of using human tools to measure human phenomena.

In studies of diagnostic and therapeutic techniques it must be remembered that no technique is a perfect instrument. The technique may, for example, overdiagnose, exaggerating the true severity or prevalence of the conditions and classifying some negatives as positives. On the other hand, the technique may be adequate in identifying minimal cases and fail, as does the tuberculin test, in far-advanced cases.

These imperfections in diagnostic techniques must be judged in relation to their importance to the problem under investigation. In nutrition studies, for example, little harm may result from overdiagnosis and from subsequently prescribing unnecessary supplemental feeding. At the other extreme, erroneous designation of a person as syphilitic, tuberculous, or cancerous may entail far more serious consequences than would failure to diagnose a true positive. Issues such as these must be carefully weighed in establishing the techniques of the study.

The participants in the Conference focused considerable attention on the question of developing adequate indices to measure the quality of medical care. Among the measurements of diagnosis and therapy cited were the statistical indices derived from frequency of autopsies, pathological examination of tissues, hospitalization, referrals by general practitioners to specialists, and check of the accuracy of initial diagnosis by general practitioners and specialists against subsequent findings. Certain indices of quality of services are available and have been employed in varying degrees in statistics on hospital care and other services.

While it was recognized that units of measurement used in evaluating health programs must inevitably change with

advances in medicine, definite criteria were held likely to remain constant for a long time. For most studies the most adequate gauge of quality of medical services at any period is the best practice then current. Realism is necessary, however, in considering such questions as the investment society is willing to make in providing medical care of high quality—a question no technician can answer. Other practical issues involve the range of special services that should be made available for limited numbers of people such as those on ships, and the decisions that must be made in setting standards for minimal services, such as the components of physical examinations for each age group.

Controls

The conferees pointed out that adequate controls or means of comparing one surveyed group with another are as essential in public health research as in any other type of scientific investigation. The need for predetermining the differences and similarities among groups in setting up controls was also stressed. Control areas or groups should have the same characteristics as the experimental areas or groups. Attention was called to the often-repeated contention that controls cannot be set up for service projects because the control areas or groups are affected either by the initial survey or by the project in the allied experimental group. If such effects are noted in the control group, however, either the control setup or the project itself was probably not well planned. Thus, if it were proposed to demonstrate that a certain type of immunization decreased susceptibility to the common cold, and if people in the control group were to have the immunization on their own accord, the project was not adequately planned to determine whether the immunization campaign affected the incidence of colds.

In tests of the efficacy of therapeutic techniques the problem is to evaluate the treatment as a means of curing or at least preventing the progression of the condition. This procedure requires an adequate device for selecting the impaired persons in the population, dividing them into comparable groups, giving one group the treatment to be tested, and giving the other group identical treatment except for the presence of the therapeutic agent. The two groups are then followed to observe cure or progression rates. The practical, ethical, and public relations problems of withholding the treatment from the control group were recognized. The benefits to be derived from conclusive results of the experiment are so great, however, that suitable controls should always be employed, and practical difficulties in conducting control studies should not be considered insurmountable.

CRITERIA FOR FIELD STUDIES

I. The objective or purpose should be:
   1. Simple and direct;
   2. Clearly defined;
   3. Related to one or, at most, two facets of the basic problem to avoid dispersion of effort and meaningless results;
   4. Capable of conclusive results with facilities and materials available;
   5. Held constant during the experiment;
   6. Applied critically to all items and phases of the experiment to determine their significance.

II. The measurements used should be:
   1. Objective;
   2. Repeatable by different observers and at different times;
   3. Efficient in terms of clear and mutually exclusive divisions, undistorted scale, and broad range of values to be recorded;
   4. As simple, generally available, easily performed, and inexpensive as possible;

5. Accurate in sensitivity and specificity;
6. Tested in pilot study.

III. Groups to be studied should be:
1. Representative;
2. Cooperative;
3. As completely comparable as possible; every effort should be made to extend this comparability to all variables other than those under examination (control and experimental groups);
4. Available for continuous observation;
5. Large enough to provide samples of adequate size to yield statistically meaningful results;
6. Screened in relation to the purposes of the study;
7. Tested in pilot study to determine extraneous factors.

IV. The collection of data should include:
A. Written instructions which:
1. Specify objectives of the study;
2. Contain definitions of terms;
3. Are clear and specific;
4. Give rules for recording;
5. Indicate frequency of observations;
6. Are tested in pilot study.
B. Staff for the study which is:
1. Competent in use of techniques;
2. Free of personal bias;
3. Able to maintain good public relations;
4. Adequately trained in pilot study.
C. Record forms which are:
1. Clear;
2. Convenient;
3. Prescribed;
4. Tested in pilot study;
5. Related to plans for final tabulations.

V. Results of study should be:
1. Related to objectives;
2. Valid within stated intervals of reliability;
3. Evaluated in light of assumptions and methodology;
4. Generalized only with realization of limitations of the data.

Criteria that are particularly applicable to studies evaluating diagnostic and therapeutic techniques may be worded as follows:

A. Preliminary laboratory or clinical studies of the technique to determine its:
1. Precision;
2. Accuracy;
3. Effectiveness of use by observers;
4. Side effects;
5. Costs.

B. Field tests to determine effectiveness in detecting:
1. Absence or presence of condition under investigation;
2. Ranges in variations from normal through abnormal conditions;
3. Specificity in differentiating among diseased conditions.

C. Population studied should:
1. Be representative of the universe under discussion;
2. Include persons with commonly occurring miscellaneous disease;
3. Exclude volunteers who may introduce spurious correlations.

D. Conduct of experiment should:
1. Recognize disease as a dynamic state, either progressing or regressing;
2. Make serial observations on both test and normal groups to:
(*a*) assess full value of test;
(*b*) ascertain complete effect of procedure;
3. Ascertain stability and progression of successive readings;
4. Determine difference in progression rates between normal and other groups;
5. Provide follow-up to determine permanency of results.

METHODS IN THE EVALUATION OF COMMUNITY HEALTH SERVICES

George St. J. Perrott, Chairman

Methodology in a Survey of Pediatric Services*

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TOWARD the end of World War II, certain leaders in the field of pediatrics were asking serious questions as to the adequacy of health services for children and the extent to which government should be responsible for making medical care of high quality available to all. It was recognized that there are broad gaps in medical care and that if these gaps are to be corrected in an orderly and intelligent manner, they must first be defined as specifically as possible. Consequently an ambitious survey was undertaken which later became known as the Study of Child Health Services and Pediatric Education.

The instigator of this survey was the American Academy of Pediatrics. The Academy is a body of pediatricians active in private practice, teaching, and research, and had neither the know-how nor the resources to conduct a health survey. At the outset, therefore, the cooperation of the U. S. Public Health Service and the U. S. Children's Bureau was requested and freely granted. The close working relationship which was established at the Federal level was reflected in a similar cooperative pattern between State and county medical societies and official health agencies—a fact which had a great deal to do with the successful conduct of the study.

The study actually began operation in the Spring of 1945 with the appointment of the first members of the central staff from the U. S. Children's Bureau and the U. S. Public Health Service. It has taken about 4 years to gather, tabulate, and analyze the desired information. We are now able to state that this Nation-wide study has been completed. The two-volume report published by the Commonwealth Fund and about 15 separate papers contain all the pertinent information.[1, 2]

There were two main divisions of the study: One was concerned with a survey of services rendered to children by doctors, hospitals, and community health agencies; the other dealt with the pediatric training given in medical schools and hospitals approved for pediatric residences. The latter part of the study was accomplished by personal visits and, although it had its difficulties, it was far less complex than the former. In this paper we shall confine our remarks to the survey of services.

Since this survey was, to say the

* From the American Academy of Pediatrics Study of Child Health Services and the Public Health Service, Federal Security Agency.

least, an unusual venture, and since in many respects it was unprecedented, it is necessary to know something of its objectives in order to understand its methods. A principle, which was basic to the initiation and conduct of the study, arose from the concept that any real advances in child care depend upon the doctors, who in their daily practice give that care, together with the agencies concerned with child health. Acceptance of this principle led to two fundamental factors which largely determined the method and scope of the survey.

First, it was recognized that the implementation of recommendations, which it was hoped would result from the study, would necessitate action at the State and local levels. Community action is stimulated far more effectively by detailed knowledge of local situations than by inferences drawn from generalities and averages. Hence, we undertook to collect the data State by State, county by county, and city by city for the entire United States and the Territory of Hawaii. We stopped short of Alaska! Sampling techniques were not used except for a special supplementary study which was done in four States to check certain details in the methodology as will be described later in this discussion.

Secondly, it was agreed that, if the interest of practicing physicians and community health agencies was to be aroused in the improvement of health services, they should be drawn into active participation in the conduct of the survey and the collection of the desired information. A physician or health agency cannot undergo critical self-analysis and appraisal of services which they themselves render, without at the same time seeking for means of filling the gaps and strengthening the services which are weak. Thus it evolved that practicing pediatricians were asked not only to report on their own services, but to assist in obtaining the desired information from their colleagues in general practice, from hospitals in which they practice, and from health agencies with which they have contact.

A central executive staff planned and guided the State studies which were set up separately in each State as the responsibility of the State chairman of the American Academy of Pediatrics. Each Academy chairman conducted the study with the help of an executive secretary and field staff that he selected to do the actual work. Over half of the executive secretaries, 33 out of a total of 56, were physicians and most of them were pediatricians. Early in the course of events these State executive secretaries were called to the central office in Washington in small groups and took an intensive course of instruction in the objectives and methodology of the survey.

Thereafter, the State offices were kept in close touch with the central office of the study, and all possible efforts were made to maintain maximum consistency of method in the collection of data. A small field staff attached to the central office visited the State offices to check techniques and help solve the many problems as they arose, and in a few instances completed the collection of the material.

Nevertheless, the vastness of the study's scope and its decentralization throughout the entire United States gave rise to enormous difficulties, and unquestionably jeopardized the statistical accuracy of the material. Despite the emphasis placed upon strict adherence to detailed instructions for the distribution and collection of schedules, irregularities were sure to appear. This was the price we paid for information of sufficient detail to be useful for constructive planning by the individual States and communities. Those of us who were responsible for analysis of the data were confident that the irregularities were not of sufficient magnitude to

introduce serious errors in the results which we have reported.

In the fall of 1945, after a few months of preliminary planning, a pilot study was done in North Carolina in order to develop methods and techniques and to test the wording and context of the schedules. In order to achieve uniform results in all States, a field manual was prepared with plans for the organization and conduct of the study based upon the North Carolina experience. Three series of schedules—18 in all—were then printed in final form for use in all other States: series I for hospitals; series II for community health agencies; and series III for physicians and dentists in private practice. Time does not permit a detailed review of the procedures involved for completing these schedules.* Suffice it to say that data were collected—mostly by personal visits—from practically all the general and special hospitals that admit children. A thorough attempt was made to have all official and voluntary agencies report on the community health services that they provided for children; the types of services covered were medical well-child conferences, dental clinics, mental hygiene clinics, clinics for the physically handicapped, communicable disease control, school health services, and public health nursing service. Doctors received their questionnaires by mail.

Exhaustive efforts were expended on preparing in each State an accurate and up-to-date list for each of these categories. A complete cataloguing of physicians and dentists in private practice was particularly difficult. Possible sources of information included membership lists of regional, State, and county medical and dental societies; records of the procurement and assignment service; lists furnished by the State licensing bureau, the State health department, and the Internal Revenue offices; and telephone directories. Thus we tabulated data for about 6,000 hospitals, almost 15,000 community health agencies, and over 182,000 physicians and dentists—more than 200,000 schedules in all.

The schedule used for physicians and dentists was kept simple, just a one-page questionnaire on which the most essential item was a record of the number of patients seen on a specified day. Almost two-thirds of the doctors gave us this information. In order to determine if there might be some hidden factors influencing responses to these mail questionnaires, we checked age, sex, race, and amount of training of the respondents. There seemed to be some tendency for the younger, better-trained practitioners with more child visits to return their schedules. However, State by State, the variations were too small to warrant any attempt at adjustment of total child visits reported.

All physicians and dentists in private practice were asked to report their services rendered on a given day which was designated on the schedule by the State office. One-seventh were asked to report for each of the days of the week, in order to obtain a fair sample of practice and to avoid choice by the individual of unrepresentative days. Sundays, holidays, and days off were included in these assignments. Thus, it was hoped that the returns would be evenly distributed over the 7 days of the week.

Respondents	*Medical general practitioners*	*Dentists*
Total number	46,261	40,895
Percentage distribution by day of week	100.0	100.0
Sunday	15.2	15.4
Monday	14.3	13.9
Tuesday	14.0	14.2
Wednesday	14.4	14.1
Thursday	14.2	14.1
Friday	14.2	14.1
Saturday	13.7	14.2

The tabulations for the United States,

* Copies of the schedules have been reproduced in the Supplement,[2] which also contains detailed description of the distribution and collection and the tabulation and analysis of the material.

on the preceding page, show the slight variation in response from the theoretical 14.3 per cent.

After all feasible means had been used to obtain the greatest possible response from doctors, there remained, of course, a proportion of individuals who did not reply. In order to complete the picture and obtain estimates of the total number of visits to physicians and dentists, including this group of nonrespondents, a special survey was conducted in New York, Illinois, Mississippi, and Oregon on a sample of physicians and dentists in private practice. This supplementary survey was done by personal visits of trained enumerators, and had as secondary purposes the checking of the validity of the data and the provision of additional information on well-child services rendered in private practice. As a result of the information thus collected, adjustment was made so as to represent services for all doctors in private practice.

Comparison of the data obtained by enumerators in the sample study with the results of the mail questionnaire showed, in general, that the doctors who did not reply to the mail questionnaire saw relatively fewer children than the respondents. We therefore established ratios of the number of child visits on the designated day per doctor who had returned the original mail questionnaire to the corresponding number of child visits per nonrespondent doctor, using the visits reported in the sample study.

As an example of the method used for the correction for nonresponse, let us consider the data for general practitioners in one county group. The interview survey in New York State showed that the average number of child visits per general practitioner was 2.66 for former respondents but only 2.12 for former nonrespondents. Therefore the average number of visits per nonrespondent was estimated as 80 per cent of the average number of visits per respondent. The total number of visits thus becomes the sum of the reported visits and the number of nonrespondents multiplied by 0.8 times the average number of visits per respondent.

The ratios of child visits per former respondent to those of former nonrespondents as obtained in the sample study were determined for each of the five county groups used in the study. These ratios were used as the projection factors for the correction of nonresponse in the original study in all States.*

A further adjustment in the number of patients per doctor was thought advisable since the information was obtained at a particular period of the year which varied from State to State. Special tabulations showing the monthly number of visits to children by physicians and dentists were used in preparing seasonal adjustment factors for each of four regions, in accordance with unpublished data from the Committee on the Costs of Medical Care.

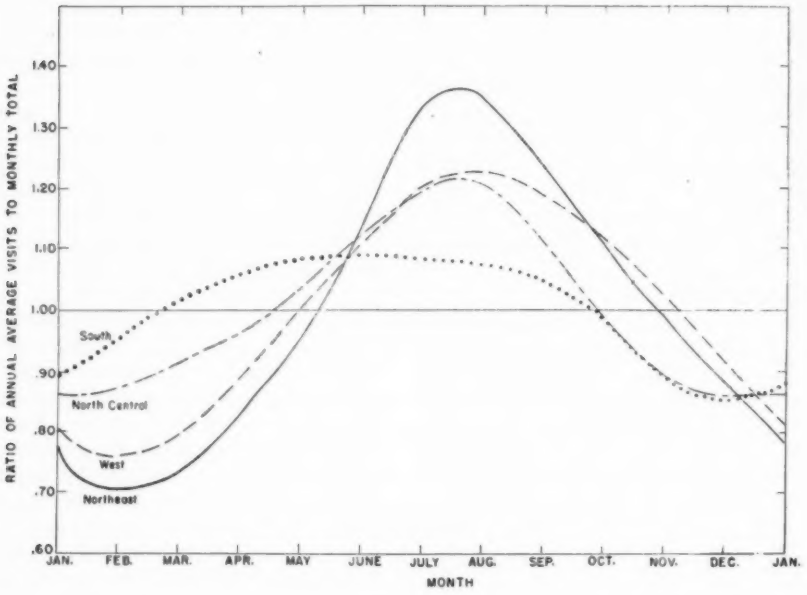
Since season influences practice differently in different parts of the country, the adjustment for seasonal variation was made separately for each State according to the grouping in four broad areas.† As is shown in the accompanying figure illustrating the practice of general practitioners, the greatest variation occurs in the Northeast, where summer practice is relatively light, while in the South there is less seasonal variation. Thus, for example, if collection of data in a Northeastern State took place during the summer months, the reported visits should be increased about one-

* The projection factors used were as follows:

	Metropolitan counties		*All other counties*
	Greater	*Lesser*	
Physicians:			
General practitioners	0.6	0.7	0.8
Pediatricians	1.0	1.0	1.0
Other specialists	0.5	0.6	0.7
Dentists	0.7	0.8	0.8

† The factors used for seasonal adjustment of service by general practitioners, by pediatricians, by other medical specialists, and by dentists in each of the four areas are given in the Supplement (2).

FIGURE 1—Monthly Variation in Child Visits to General Practitioners in Four Regions



third to bring them up to the average for the year. If the reported visits took place during the late winter, the figures are about one-third higher than the annual average.

By way of illustration, let us consider the returns from the State of Maryland. In this State the collection of physicians' records was distributed over 3 months as follows: July 50 per cent, August 25 per cent, and September 25 per cent. From figure 1 we read off the respective seasonal factors of 1.08, 1.07, and 1.05 for these 3 months in the Southern region. Using the proportion of schedules as weights, we arrive at 1.07 as the weighted seasonal factor. The number of visits recorded for general practitioners was then multiplied by this factor 1.07, in order to obtain the number of visits for an average day of the year. The computations were actually carried through for sick and well-child visits by age group of children for each type of practitioner within each county group.

The method of presentation of the material depended upon comparisons between geographic divisions to show variations in child health services in the absence of standards. Some of the material was shown State by State; some of the comparisons were made on a regional basis so as to compare one large section of the country with another; and some of the material was shown for groups of counties compared with other groups of counties. This latter basis of comparison warrants special attention.

At the outset we accepted the fact that the usual differentiation between rural and urban is unsatisfactory for comparisons of medical services. Many people living in rural areas are at the same time near enough to urban centers to permit easy access to the facilities of those centers. However, in rural

areas far removed from urban centers, services received are for the most part restricted to those which can be obtained locally.

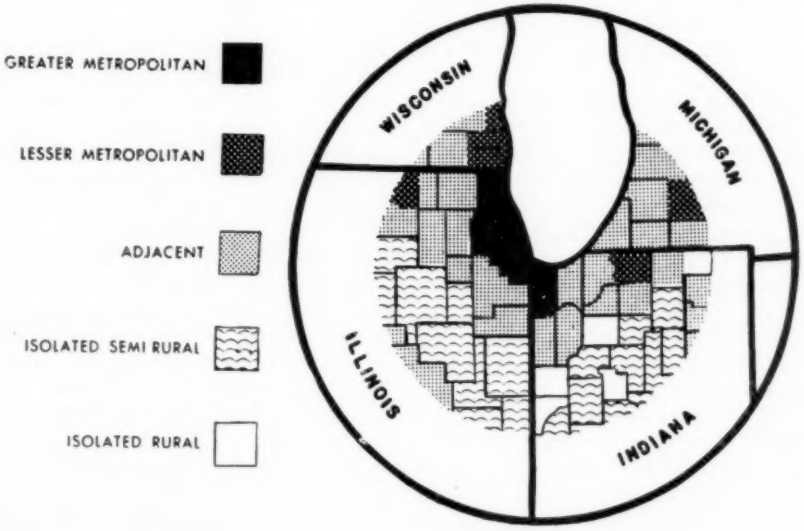
Therefore, counties were grouped together to form service areas recognizing two fundamental characteristics: population, and proximity to densely populated areas. In this way consideration was given to areas which, although they themselves may be sparsely populated, are none the less relatively close to metropolitan areas and the medical facilities ordinarily available in such centers. For practical purposes these service areas were established so as not to cross county lines.[3]

Five groups of counties were created (fig. 2). The metropolitan counties, which include the metropolitan districts of cities of 50,000 or more persons as set up by the U. S. Bureau of the Census, were subdivided into greater metropolitan and lesser metropolitan, the former being in or around the 12 largest cities of the United States. Counties geographically contiguous to any of the metropolitan counties were classified as adjacent. The remaining counties were subdivided into isolated semirural and isolated rural, depending upon the presence or absence of an incorporated place of 2,500 or more inhabitants.*

The unusual feature of this manner of classification is in the use of the adjacent category. It is recognized that a large hospital in an urban center serves not only the county in which it is located, but also the surrounding counties. It is for hospital services and the services of specialists that the use of the term "adjacent" is particularly suitable. By grouping metropolitan and adjacent counties together, we have established a reasonably reliable service area for hospital and specialist services so that comparisons may be made with the combined isolated counties. On the other hand, it is fair to assume that

* Acknowledgment is made to Elliott H. Pennell and the staff of the States Relations Divisions of the U. S. Public Health Service for the basis of this classification.

FIGURE 2—Example of County Grouping



physicians and dentists in general practice tend to limit their practice to the care of children residing in the immediate area of their location. Therefore, data for these physicians and dentists are discussed separately for each of the 5 county groups.

At this point it may be noted that our data were set up for regional, State, and county group comparisons and, secondly, that the data were all-inclusive, covering every type of health service given to children. Thus it became possible to prepare a composite picture of the "total volume of medical care" and thereby to show the variations in the attained level of service in the more favored areas in comparison with that in other parts of the country. This composite was obtained by adding together the medical care (expressed as child visits or hospital days) rendered to children in private practice (home and office visits), in hospitals, and in clinics (including outpatient departments of hospitals, well-child conferences, mental hygiene clinics, and clinics for the physically handicapped). Exclusion of the physicians' hospital visits from the item for private practice was necessary to avoid duplication with the item for children in hospitals.

For this picture of the relative volume of medical care, equal weight was given to a physician's home or office visit, a day of hospital care, and a clinic visit. Much thought was given to the question of giving added weight for hospital care, but it was considered inadvisable to do so. Hence the importance of the hospital as a needed facility for treating severe illness of children may have been underestimated in the figure for total volume of care.

Previous to this study no Nation-wide data existed on children's admissions to hospitals. The item was obtained with considerable difficulty; in many hospitals special sampling estimates were required. Records of the days of care received by children were seldom obtainable. From a preliminary analysis of available material in a limited number of hospitals, it appeared that the average length of stay for children was about one week. The 7-day average per child admission was used in computing the number of children in general hospitals on one day. This procedure has minimized the differences in the volume of care between metropolitan and isolated counties and among the States, because of the fact that the average stay for children is longer in the larger hospitals and in the more prosperous areas.

The summation of the various components of medical care in the way described has resulted in an estimate of the total number of children under medical care on an average day. When related to child population, we have a valid and useful index of the total volume of medical care received.

In order to relate the amount of health services to the number of children in a given area, we had to know the size of the child population. The census data for 1940 were not considered reliable as a basis of extrapolation because of the large shifts in population during the war years. It was considered essential to determine the number of children, county by county, for 1945. A method was devised for estimating the population under 5 years of age in each county on the basis of the number of births during the 5 preceding years, with adjustments for survival rates and underregistration. The number of children aged 5 to 15 in each county was estimated on the basis of the percentage change in school enrollment since 1940. The two estimates thus obtained were combined to form the population under 15 years of age for each county in the United States.[3]

In conclusion I wish to summarize some of the unique aspects of the Study of Child Health Services.[4] This is the

first Nation-wide study of health services for a segment of the population. Voluntary and official agencies and also practicing physicians have cooperated in this mass survey. Although planned and directed by a central staff, the operation was actually conducted separately by the individual States. The collection of a one-day record of visits from a large proportion of the practicing physicians and dentists was a real achievement. Data were obtained from all hospitals admitting children and from certain types of community health agencies, private as well as public. Such complete data made possible the use of an index of "total volume of medical care," as a basis of comparing the amount of care given to children in different areas. Detailed information is available for local use and for the writing of State reports. The two-volume national report and a few special papers present all the pertinent material obtained in the study.

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Evaluation of the Extension of Medical School Services to Rural Areas

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ON July 1, 1948, the U. S. Public Health Service awarded a grant of money to the Tulane University of Louisiana School of Medicine for the purpose of determining what contribution, if any, the medical school could make to the improvement of medical care in rural areas. It was reasoned that, if more complete diagnostic facilities, consultations from selected specialists, and the educational services of the medical school could be made available to practicing physicians in rural areas adjacent to the school, much could be done to meet the needs for improved diagnostic and therapeutic facilities and to lessen the isolation of physicians practicing in rural areas. In addition, such a program might attract physicians to these areas and increase the medical manpower where needed. Finally, the purpose of this study would be to determine whether or not a medical school could so expand its function, what the program would cost, how it could best be accomplished, and the end results.

Objectives

The first step in planning was the selection of the area for the proposed study. Because of the obvious needs for improved medical facilities, their proximity to the school, and previous contacts with physicians in this section, a group of six counties (Greene, Perry, Stone, Forrest, Lamar, and Pearl River counties) in Southeast Mississippi were selected for the project. Another reason for this choice was that many of the physicians in this area are graduates of, or have had postgraduate work at, the Tulane University of Louisiana School of Medicine, which made for a closer tie with the school. In setting up the program, the school's faculty committee governing the policies of the project formulated the following preliminary objectives:

1. To select two groups of counties in Southeast Mississippi, comparable in population, social and economic conditions, number of physicians, number of urban communities of comparable size, proportions of Negro and white population, and other factors. One group of three counties would be used as a control and the remaining three counties as a study area. The same data would be collected in both groups of counties, but services from the school would be extended only to the study counties.

2. To survey sample population groups in the two areas to determine:
   (a) Social and economic status (ability to pay for medical care).
   (b) Availability of medical care when needed.
   (c) Specific disease and health problems among the population.

3. To survey the practices of physicians (quality and quantity), hospitals, and other existing facilities for medical care.

4. Following collection of the above information, to institute services from the medical school in the study area to meet the needs for medical care, as shown by the surveys, insofar as would be possible; to attempt to demonstrate what could be done by the school to meet these needs.

5. To repeat at the end of the study period (tentatively 3 to 5 years) to learn:
   (a) What had been accomplished by the program.

(b) The cost of the program.
(c) Effectiveness of the program, and benefits to the study area and the school.

It was at once apparent that a primary prerequisite to the success of the plan was the active support and cooperation of the professional groups in the study area. Personal visits were made to the State Health Department, to State and local medical societies, and to the individual physicians in order to solicit their cooperation. A questionnaire was developed for these visits, and information was secured concerning the quality and the quantity of the physicians' practice.

In order to determine whether the above objectives of the plan were practical, it was decided to make a pilot study in one county. Several interesting facts obtained from this pilot study culminated in the decision to limit the scope of the program. First, it was apparent that economic conditions and lack of transportation facilities were major factors contributing to the inadequacy of medical care or the inability of people to obtain medical care. Second, the pilot study demonstrated that physicians carried tremendously heavy case loads, often with meager facilities for giving medical care. Third, it also established the fact that the people of that county sought medical care in the main from their local physician.

As a consequence, the faculty committee decided to eliminate the control group of counties for the following reasons:

(a) Since no services could be given to this group, it would be unlikely that they would cooperate wholeheartedly in this project.
(b) Any survey of this type would tend to influence the medical care in these counties in some degree, so that it would not produce a really objective body of information.
(c) With the lack of hospital facilities and physicians in certain sections of the study area and the concentration of existing services within two or three larger centers, it seemed that the best possible expenditure of money could be made in providing, as quickly as possible, the needed assistance to physicians, since they were carrying the burden of medical care for the people.
(d) Considerable time had elapsed since the first contacts with physicians; to retain their interest and cooperation, it was believed necessary to initiate the services promised them as quickly as was advisable, in view of the surveys and other studies that must be done.

It was also decided that the information from the proposed population studies was not absolutely essential to the type of program now contemplated. Such population surveys would demand greatly increased personnel, to be located and trained for the study, involving very considerable expenditure of the available funds and exhausting precious time. The major effort was therefore concentrated on meeting the needs of the physicians for better services to their patients, rather than on attempting to meet the needs of the population for medical care generally. The end result of the project with either approach would logically be improved medical care for the people.

Records for obtaining information from the physicians were revised and all doctors in the six counties were asked to keep a record of every patient seen each day for a period of one week. The Roster of the Board of Medical Examiners listed 63 physicians in the six counties, only one of whom was a Negro. Courtesy calls were made to each of the physicians, supplemented by talks to the medical societies in the six counties. It was appreciated from the beginning that offense to the physicians could be avoided only by using extreme tact and that, without their early acceptance of the project, it was foredoomed to failure. No little salesmanship was required to enlist the acceptance of the project by the physicians and finally their definite, if not always enthusiastic, support. At the beginning of the project, some doubt was expressed by some of the physicians as to the reasons for the program. Some

felt that it was a "wedge" for socialized medicine. Others mistrusted the motives of the school in initiating such a service.

It was pointed out to these physicians that, far from providing an opening wedge for socialized medicine, the school hoped to be of assistance to these communities in developing their own resources to meet their needs for medical services—a step which would make the so-called socialized type of medicine unnecessary. Second, the medical school was not entirely unselfish in its desire to serve them, since it hoped to benefit by having its faculty establish closer contacts with physicians actually meeting the daily problems and difficulties of rural practice, and thereby become better teachers of medical students.

Another question raised by a physician in the older age group was whether the school intended that the survey might provide information for the placement of doctors, perhaps displacing older physicians in an established community. This question was easily answered by the well-known fact that the demand for physicians was so much greater than the available supply, that the school could not, even if it so desired, find enough physicians to place in all the rural communities.

It was indicative of the local interest on the part of the physicians in these six counties that not one refused to cooperate in keeping the data asked of him, although it meant considerable effort on their part and time from their work. These data, totaling more than 6,000 records, were collected and subjected to statistical analyses. The purpose of these data was to ascertain the type and scope of the medical practice of rural physicians, to determine the need for consultations and additional laboratory services, and to evaluate more concretely what the medical school could provide in the way of improved medical care. Unfortunately, these data cannot be used for critical analyses of the quality of medical practice, only the quantity. Yet it was obvious that improved ancillary services, such as X-rays, laboratory facilities, and the like, must add to the quality of medical care as well as to the quantity.

Methods

The activities within the study area may now be summarized as follows:

1. Consultant out-patient services in all specialties for patients referred to the Hutchinson Memorial Clinic, Tulane University, New Orleans. It was hoped that these services would not only provide consultations from specialists in the various fields, but also make available certain procedures, such as biochemical determinations, bacteriologic studies, cystoscopy, proctoscopy, stool examinations, roentgenologic observations, and the like, which were unavailable in the project area. Though theoretically practical, these services have not been utilized as freely or as enthusiastically as was expected. Certain practical difficulties were immediately encountered, such as the expense of travel and frequently of board and lodging for a day or two in New Orleans, as well as the psychologic barriers on the part of both the personal physicians and the patients against referral to a medical center. In that connection, it soon became apparent that it was more desirable to develop the medical facilities within each community to the maximum possible extent.
2. The development of subcenters within the project area to which patients may be referred for the more commonly needed diagnostic and therapeutic procedures. Five such centers have been established in Hattiesburg, Mississippi, and all physicians within the area have been notified that they may refer patients to these centers for various laboratory tests, roentgenologic studies, basal metabolic determinations, and electrocardiograms—procedures which are not usually available to the physician practicing in a rural area. It was gratifying to note that the young doctor who recently located in Leakesville, a small, remote community, promptly availed himself of this privilege, and the requests from other physicians are increasing steadily.
3. Consultant services from members of the Tulane faculty. Periodically scheduled consultant services in medicine, surgery, pathology, clinical pathology, and radiology have been arranged for the physicians in the three

dominant centers of the project area—Picayune, Lumberton, and Hattiesburg. In addition, consultant services are provided by appointment in pediatrics, obstetrics and gynecology, and ophthalmology. These consultants not only conduct teaching rounds within the hospitals but also see individual patients in consultation. The consultants were selected not only for proficiency within their chosen field, but also for their consideration, tact, and teaching ability. Again, it must be emphasized that physicians within the area were slow to take full advantage of these consultant visits, but interest in these visits at the present time is decidedly on the upgrade.

4. Educational activities for all physicians within the project area. From the pilot study, it was obvious that most of the physicians carried excessive patient loads, that they had little or no time for professional study, and that, being isolated, they had little or no stimulus to keep abreast of scientific developments. No inconsiderable amount of effort has been expended to rejuvenate enthusiasm and interest in the scientific aspects of medical practice. This effort has taken several forms:
   (a) Monthly lectures and demonstrations at Hattiesburg, to which all physicians within the area are invited. Both the topics and the lecturers are carefully selected to provide up-to-date discussions of timely subjects. Usually the lecturers see several patients in consultation at the same time. A summary of each lecture is mimeographed and mailed to each physician within the project area.
   (b) Establishment of a medical library in Hattiesburg. A section of the public library in Hattiesburg has been set aside for a medical library, and books and current periodicals are supplied by exchange with the Tulane library.
   (c) Continuation teaching. A daily schedule of ward rounds, diagnostic seminars, and conferences has been published, and an invitation has been issued to all physicians to avail themselves of this opportunity at any time that they may be in New Orleans.
   (d) Refresher courses. A series of refresher courses in every field is conducted annually at Tulane and each physician receives an invitation to attend such course in the field of his immediate interest.
   (e) Conferences for general practitioners. It is planned to have teams of the Tulane faculty conduct special conferences in Hattiesburg designed primarily for the general practitioner.
5. The improvement of ancillary services. One of the major obstacles to the improvement of medical care is the scarcity of laboratory technicians, radiology technicians, and other skilled nonprofessional personnel to work in private offices, clinics, and the small hospitals within this area. Several girls have been encouraged to take short courses in laboratory technology in the medical school in New Orleans. In addition, a trained technician has been obtained for the hospital at Lumberton, and similar assistance has been offered to several other small groups.
6. The interpretation of laboratory tests. One of the most active as well as most gratifying contributions to the program has been the assistance that the school could provide for daily interpretations of electrocardiograms, pathologic slides, and X-ray films which are referred to the several departments at Tulane. Arrangements have also been made for regular weekly visits of a qualified radiologist to proceed from Hattiesburg to the newly opened hospital at Leakesville, and it is hoped that more opportunities of this type will develop.
7. Development of a lay council. One of the purposes of the project is to stimulate the desire on the part of both physicians and community for better medical care facilities, so that each community will ultimately become more or less self-sufficient. To that end, we are encouraging the development of an over-all guiding council consisting of both lay and professional persons prominent in the community life of Hattiesburg. The formation of this council is proceeding slowly. Success may finally depend upon a subsidy for office space and secretarial assistance.

Evaluation

From the beginning, the faculty has realized that it is extremely difficult to measure the quality of medical practice in any given area. Data have been accumulated concerning the quantity of medical practices (such as the number and types of physical examinations, frequency of visits, miles traveled and time consumed in seeing patients, types of diseases encountered, number of laboratory procedures and X-ray studies performed, the need for consultations, and the like), but such data are not

amenable to evaluation of the quality of these professional services. On the other hand, it is logical that more widespread use of the ancillary services in both diagnosis and treatment of disease must enhance the quality. No standard indices exist by which the quality of the sampling procedures can be measured. Because of the recent war and the number of large military establishments located in these six counties, any data concerning the population, for example, would be hopelessly out of date. By the same token, no accurate data were available for comparing former and current infant mortality or maternal mortality. Both of these indices would have been influenced by the changes in the country at large and in the area in particular arising from the shifts in the population resulting from the war effort. Any figures concerning the death rate were likewise discounted. Finally, the human equation has constantly ranked high in the consideration of the faculty.

Progress in the extension as well as in the measurement of such an intangible value as improved medical care requires great tact in obtaining the wholehearted cooperation of all physicians in the area under study. Although no criteria have been defined to evaluate the results of the study, the faculty is convinced that the school has been able to make a definite, though intangible, contribution. This contribution is measured by increasing interest of each physician in the newer developments and discoveries in the science of medicine. It is reflected by more widespread and discriminate selection of laboratory and roentgenologic studies; by intelligent referral of patients for consultations; by the growing attendance at the various medical society meetings and conferences; by the quality and composition of the histories and physical examinations recorded both within the offices and in the hospitals utilized by these physicians; by the increasing circulation of medical journals, text books, and monographs obtained from the medical library. Medical care is enhanced by the number and quality of training of personnel available in the ancillary services, such as laboratories, the X-ray department, nursing services, and other categories. It is influenced by the transportation facilities, the centers of economic intercourse, the type and availability of hospital beds, both for the acutely ill and the chronically ill, the adequacy of the health department, and the general economic conditions prevailing within the community. Progress in medical care, to be definite, must above all be desired and its rate of change is frequently subtle, diverse, and slow. If these factors are appreciated and weighed, the project is just beginning to take form, even though no criteria have yet been evolved to record these changes.

Evaluation of Health Education Activities by Opinion-Poll Techniques

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LARGE sums of money and much effort on the part of health educators are dedicated to the mass communication of knowledge by means of radio, television, mailed material, newspapers, magazines, and other mass media. How effective are these activities? How can they be made more successful? With the aid of a grant from the U. S. Public Health Service and with the cooperation of our Health Department, Tuberculosis and Health Association, Pharmaceutical Association, Medical Society, P.T.A., and other community groups, we have been seeking answers to these questions in San Diego. We have sought to evaluate health education activities in our area by opinion-poll and other techniques. The specific aims of our project are:

1. To determine the relative effectiveness of various media (such as newspapers, radio, motion pictures, door-to-door calls, mailed literature, organizational work, etc.).
2. To develop evaluational techniques, particularly of the sample survey type.
3. To develop new methods and procedures for reaching persons not now appreciably affected by health education activities—in particular, to develop more effective ways of communicating health knowledge to older persons.
4. To develop techniques in health education which will lead adults to seek periodic physical check-ups.

We are making use of a method which has much in common with one that has enjoyed great success in the field of business, namely, that of analyzing the "market," devising ways and means of reaching it, and then checking on the validity of the measures taken.

Periodic Physical Examination Study

A number of factors influenced our choice of a campaign theme. Seeking to minimize the influence of health education activities originating outside of San Diego, we decided to concentrate upon regular physical examinations. We recognized that the subject was not an entirely new one, but we found that it had not been used to any great extent in this country, except in connection with other campaigns. We felt that regular physical examinations represented a significant area of health behavior. A campaign on this topic reached a climax in our city during the week of April 24, 1950, and included use of posters, postage-meter stamps, mimeographed literature, newspaper publicity, drug-store displays, service-club talks, and radio and television programs. The effectiveness of the campaign and of the various media which figured in it are being assessed by: (1) sample surveys of the oral-interview type; (2) records of visits to physicians made before, during, and after the campaign; and (3) telephone surveys similar to those made by Hooper, but yielding more detailed information regarding the personal characteristics of respondents.

Prior to the beginning of the campaign we conducted two city-wide surveys in the course of which we obtained information on a sample of 2,700 adult

respondents, half of whom were men. Personal interviews were obtained in 2,700 dwelling units scattered throughout the city of San Diego. The addresses used in the surveys were selected at random from a complete list of all dwelling units in the city. Review of the data obtained indicates that we have a representative sample of the population in our area, as judged by census statistics. We know a great deal about our subjects, including age, race, income, education, newspaper subscribership, radio listening habits, and occupation. We also have information about their health knowledge, attitudes, and behavior. For some of our studies, this group of 2,700 persons has been broken down into control and experimental groups, equated insofar as possible with regard to the major variables. Both groups have been exposed to the campaign waged in our community, but the experimental group has received special attention in the form of mailed material and in other ways. We plan to follow both groups during the coming year.

Evaluation of Data

The results of assessment studies cannot always be taken at face value; the over-all findings sometimes are very misleading. Often breakdowns of the data are far more revealing than the totals. One of the great merits of the sample survey approach is that it permits data to be broken down quickly in terms of meaningful variables. A mass X-ray survey may reach 90 per cent of the people of an area and be almost a complete failure if it does not reach most of the people who are tuberculous. A radio program may command a tremendous audience, and achieve an impressive Hooperating, and still not do the job for which it was created.

When we have gathered data on the relative effectiveness of various media, our job of evaluation is not over. In appraising a health education technique, we still must ask ourselves: (1) Does it reach the people who need to be reached and who are not being reached by other procedures? (2) Is it effective in producing behavior of the desired kind? For example, one technique may produce more increase in information than another, but may be less successful in altering behavior patterns. (3) In terms of effort and expense, are the results obtained worthwhile? For example, even though it may be demonstrated that few people noted the slogans carried on our postage-meter stamps, and even though few people were swayed by these slogans alone, if it can be shown that the stamps do have some effect, their use can be justified because of the small amount of effort and money involved in their use.

Let's consider the evaluation program now being carried on in San Diego in connection with our campaign on the subject of regular physical examinations. As mentioned earlier, we have asked a representative group of general practitioners to keep records of requests for routine physical check-ups prior to, during, and after our campaign. These records will not yield an entirely accurate picture of our achievement. Health education activities may produce no demonstrable effects over a considerable period, but subtle changes may be occurring in those who are the targets of the campaign. Perhaps suddenly they may succumb to the message that is being communicated to them. Simply because overt changes are not immediately evident, it does not follow that the work is without value. A man may resist the advice that he ought to seek a physical examination for months or years and then suddenly act upon the recommendation. Perhaps the newspaper article or radio program which leads him to action would have had no effect if it had not been preceded by a great deal of previous health education.

We are making a special effort to

reach persons over 50 years of age since a preliminary study indicates that this group contains the highest percentage of persons who have not had recent physical examinations. A radio series on the subject of geriatrics is being presented with older persons in mind. It is conceivable that many of our programs will be heard by persons in the younger age brackets and have no immediate effect upon them. The programs may, however, lead these younger persons to encourage their parents and grandparents to seek medical check-ups. Perhaps 15 or 20 years later the experience of these young adults may have a decisive influence upon their future health behavior and may lead many of them to submit to regular physical examinations. How can one fully assess such a possibility?

Our findings in a campaign on routine physical check-ups may not carry over to health education work on other topics, except in a very general way. Methods which are successful with one disease are not necessarily the methods which will be most effective with other diseases. For example, the methods which are likely to yield the best results in the fight against syphilis and gonorrhea are not necessarily the methods that will be most profitable in the battle against diabetes. People are likely to regard tuberculosis as socially more disabling than heart disease and this attitude needs to be recognized in the design of our campaigns.

The results of health education research are and perhaps always will be largely locality-specific, although certain general principles may have Nation-wide application. We have no illusion that we are developing laws that will hold at all times and in all places. We believe however, that the job of health education evaluation is one without end, and one that each community must do for itself.

A year ago we evaluated by the Hooperating method a radio series on venereal diseases developed by the U. S. Public Health Service. We found that a very marked drop in listening occurred after the series had been under way for a number of weeks. A superficial examination of the facts might easily have led one to believe that there was a marked drop in public interest in the series. A more likely hypothesis, however, is that the drop occurred because of the beginning of the baseball broadcasts just when the venereal disease programs were scheduled. Other cities presenting the venereal disease series may not have experienced this drop.

We also found evidence of a rhythm with regard to listening. The programs were presented each Saturday afternoon at 3:30 p.m., and the Hooperatings were higher on some Saturdays than on others. We have reason to believe that pay days had a great deal to do with this rhythm. It is quite possible that this rhythm with regard to Saturday afternoon listening occurs in other cities, but it may be absent in agricultural areas.

Economic conditions, educational conditions, and health conditions vary greatly from one part of the country to another. The effectiveness of the various mass communication media also varies considerably from locality to locality. For example, there are certain areas in the Rocky Mountain States where only a single radio station can be heard at all times. Programs sent out over such a station are far more effective than programs delivered over stations located in heavily populated areas where there is intense competition for the attention of listeners. A method that may prove successful in one area may be completely inadequate in another. Consideration must always be given to the strength of competing media in a given area. The point is that even if we establish that radio programs are less effective than newspaper publicity in San Diego, it does not follow that the same is true

of Rigby, Idaho, or of another locality.

Use of Polls in Health Education Work

How accurate are polling procedures? How can they be useful in the public health field? The measurement of public information and opinion is not a fully developed science at the present time, but our technical knowledge is sufficiently advanced in this field to justify its use in public health work. Although it must be conceded that many problems remain to be solved in the selection of sample populations, wording of questions, sequence of items, and training of interviewers, there is today no satisfactory substitute for this method of evaluating mass health education activities.

Some people have been misled by the inability of the Gallup and Roper organizations to foresee the outcome of the 1948 presidential campaign. The only conclusion that can be drawn from the failure of these polls is that the claims made for the accuracy of the procedures were not sufficiently modest. It is only fair to mention that predicting the outcome of a national election is one of the most difficult problems in polling, because reference is made to the future acts of people. Sometimes we ourselves do not know for certain what we are going to do or how we are going to feel the next day. However, it is well for us to recognize that Gallup, in his darkest hour, came very close to the actual facts. In the closest presidential election since 1916, with four major candidates in the field, Gallup underestimated Truman's vote by 5½ percent. He accomplished this result using the quota-control method, which many regard as less sound than the probability method of sampling employed in our San Diego studies. Even an error of 6 percent does not materially reduce the value of a sample survey for most types of health education work.

Some of the applications of the polling method in public health work are as follows:

1. *Polling methods can be used in planning, conducting, and evaluating health education campaigns*—For example, in December 1949, and January 1950, the U. S. Public Health Service, in cooperation with our Health Department and County Medical Society, carried on a mass X-ray survey in the San Diego area. We were able to interview people before and during the campaign. Our preliminary study showed that about 40 percent of the adult population never had had a chest X-ray, and that a disproportionate number of older persons were to be found in this group.

Before the X-ray survey began, respondents also were asked the following question: "Next month an effort will be made to secure chest X-rays of all San Diegans 15 years of age and older. The chest X-ray will be free and can be taken in your neighborhood or at other convenient locations. Do you think that you will have a chest X-ray taken?" Those who replied in the negative then were questioned, "Why don't you plan to have an X-ray taken?"

On the basis of the results obtained in the poll, we were able to foresee many of the problems that arose during the campaign. We also were able to demonstrate that the educational work produced a significant increase in the number of persons who were willing to be X-rayed. A later poll has shown that persons over age 60, on a percentage basis, participated in the X-ray survey less than any other adult age group. This information will be useful in carrying forward the tuberculosis control program of our Health Department.

Another San Diego study illustrates the value of polling procedures in evaluating health education work. Restaurant grading with conspicuous public display of grades was initiated by our Health Department in February 1948. The Health Department's Bureau of Public

Health Education, headed by Mrs. Marion T. Bryant, led an intensive campaign to acquaint the public with the meaning of the grades on the placards. It then was decided to assess the work by a poll, and the following question was used: "How do you judge whether or not an eating place is a sanitary place in which to dine?" Although the question was of the free-answer type, it was gratifying to find that about two-thirds of the respondents mentioned the cards.

2. *Polls can be used in gathering information useful to volunteer health organizations in the conduct of their fund-raising campaigns*—The American Cancer Society has used sample survey methods in obtaining information on its fund-raising activities, and no doubt has gained many valuable facts that will be exploited in future campaigns.

3. *Sample survey methods can be employed in determining the usefulness of publications published by health departments and volunteer health organizations*—At the suggestion of our County Health Department we are planning to make a study of the effectiveness of its monthly publication. It is sent out to about 2,500 persons and about 10 percent of them will be selected at random and questioned about it. They will be asked to indicate the sections they find most interesting and informative, and those which are least valuable. They also will be invited to suggest ways of improving it.

4. *Opinion polls may be helpful in obtaining additional public support for health programs*—Some years ago an organization known as the Minnesota Committee on Local Health Services sought to expand local facilities in that State. They helped sponsor a Statewide poll conducted by the *Minneapolis Tribune* and were gratified to learn that approximately three-fourths of the people of Minnesota shared their belief that local health services needed to be expanded. They were able to determine that older persons, those in the low-income groups, and those living in rural areas were most resistant to the development of full-time local health services throughout Minnesota. Significantly, these were the groups that stood to gain most from the proposed program, and this information was of some help in conducting the campaign that followed. It also was shown that approximately 75 percent of those questioned were willing to pay a little more in taxes each year to support local health departments.

If it can be demonstrated that a large percentage of the people in the community are desirous of additional health services or an improvement in health conditions, this type of evidence carries much weight with legislative and other bodies in a position to expedite health progress. Although the Minnesota legislation was not passed at the time, we have here another example of the possible utilization of the sample survey method in the health field.

It was the experience of the Minnesota group, and it has been our experience in San Diego, that a survey which shows that an educational campaign is making progress has a tremendous uplifting effect upon the morale of health educators and those who share their hopes and goals. This is not the least of the advantages to be derived from the use of polls.

5. *Polls are useful in quickly gathering information essential to the understanding of the health needs of a community*—For example, in this way data can be collected on the incidence of nonreportable diseases, population mobility, and shifts in the economic status of residents. Such data often have important implications for a sound health program. If, for example, a sample survey indicates a very marked migration into an area, it is important to know the source or sources of the in-migration. It may be that most of the newcomers are arriving

from a part of the country in which immunization procedures have not been used to any great extent. It also may be learned that the newcomers are concentrating in certain sections of the city. This is the type of information that health educators need if they are to make a maximum contribution.

Sample surveys can be used in ascertaining knowledge of available health facilities, such as X-ray and prenatal services. Our San Diego studies show that a large percentage of our population have been unaware of their public health opportunities, possibly because we have been joined by many newcomers.

Evaluation in Smaller Communities

If it is granted that each community must carry on a continuous evaluation of its own health education program, and if it is acknowledged that polling methods are useful in such a study, how are polls to be managed and financed in the smaller cities and towns?

It seems to me that the solution lies in the utilization of the services of polling experts attached to colleges, State health departments, or other agencies with facilities for the tabulation and organization of data. These experts could design questionnaires and develop survey procedures which would be applicable to most communities. If funds are insufficient or lacking, the field work could be done by volunteers. Our San Diego experience indicates that parent-teacher groups are a very important resource for this kind of work. In carefully controlled studies, we have found that women volunteers obtained results which were very similar to those reported by students in a college public-opinion measurement course. The volunteers received less than 2 hours of training as against the much more intensive preparation of the students. We are greatly encouraged by this finding, for it means that almost any community, given some outside guidance, can assess its own health education procedures.

Surveying Community Needs

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Purpose and Scope

METHODS of surveying community needs in relation to health usually embrace administrative research and exploration primarily, in contrast with more refined epidemiological and clinical processes. They may include a variety of procedures, including descriptive, historical, experimental, philosophical, prognostic, sociological, and creative, fully utilizing statistics. Others here will deal with methodology applicable to the study of diseases or conditions of long duration in population groups, to which the late Edgar Sydenstricker contributed, for example, in the Hagerstown Morbidity Studies and elsewhere,[1] and in which the late Wade Hampton Frost and Lowell Reed participated, extending the methods to conditions involved in the maintenance of health.[2]

A critical review of methods of measuring community needs is timely. Group judgment and common opinion have contributed to the development of criteria and plans for health practices. That sunlight is beneficial (when used properly) was supported, for example, by common opinion of doctors and laity since the time of the Greeks, and was supported by statistical evidence before the scientific, rational, and definite confirmation was obtained regarding its effects in preventing rickets.

Twenty-five years ago, in a paper on "Rendering an Account in Public Health," Frost urged a firmer scientific basis for procedures of preventive medicine and public health and stated that "the first step towards collecting better evidence is to recognize the deficiencies of that which is at hand." In opening the discussion of this presentation, the late Charles V. Chapin commented that the message "would have been opportune at any time during the past forty years and, it is to be feared, will be equally needed for forty years to come." Some progress has been made, but more is due in the remaining 15 years of Chapin's time limit.

A century ago, Chadwick, Graunt, and Farr in Great Britain, and Shattuck in the United States laid the groundwork for studies in social pathology.[3] Subsequently in 1875, John S. Billings, M.D., Assistant Surgeon of the U. S. Army and chairman of a committee of the American Public Health Association, drew up with his committee a List of Questions relating to the sanitary conditions of a city or town, ". . . intended to obtain, as far as possible, the information which would be desired in estimating the healthfulness of a given place, and to ascertain the local and especially the preventable causes of disease at that point. Facts and not opinions are desired, and the questions are drawn up in that point of view."[4]

Surgeon General Leonard Scheele recently emphasized the need for union of the natural sciences and the social sciences, and observed that many measurements in the social sciences are sufficiently exact for objective analysis and scientific conclusion. "The methods for estimating the number of physically

NOTE: Grateful acknowledgment is made of suggestions received from Robert Brown, M.P.H., Edward Cohart, M.D., Roscoe Kandle, M.D., Milton Roemer, M.D., and Charles Wilson, M.D.

handicapped persons in the United States," he said, "probably yield as exact results as the methods for estimating the number of bacteria in one cubic centimeter of milk."[5] And further, "certainly, there is room in all fields of research for improvement in methodology. Those of us who are concerned with medicine and medical research, however, must conclude that the question of the 'validity' of the social versus the natural sciences is primarily academic."

Many methods of studying the needs in health and of measuring the efficiency of public health measures in a community have been utilized, with varying degrees of success. It is difficult to devise a single type of "yardstick," applicable in all localities and under varying conditions. The needs and resources of each are somewhat different. Both lay and professional groups should be brought together to study jointly the solution of problems affecting health, be they preventive, therapeutic, or environmental.[6] Until recently, most of the appraisal methods have featured the amount or extensiveness of service performed, but in the last 15 years or more, efforts have been made to develop techniques of qualitative evaluation in the application of sound administrative methods to public health practice.

Relationships

In 1936, a report in Great Britain showed overcrowding to be closely associated with industry. However, from some viewpoints, a contrast can be drawn more clearly between the social conditions of industrial and agricultural areas than those of "town" and "country." Also, the Social Surveys of Merseyside, Sheffield, Bristol, and Southampton showed a proportion of 12 to 15 percent of their families or 20 to 30 percent of their children as living below the poverty line. This meant that "they had not enough money for the mother, even if she were a perfect housewife, to pay for the bare essentials of rent, food, clothing, fire, light, and cleaning materials necessary to keep her family in health." Sir John Orr calculated that in 1936 one-tenth of the nation's population, including one in four of its children, spent only 4*s*. weekly a head on food and had a dietary lacking in all the constituents most essential to health. Poverty was proved in the towns.[7]

The interrelationships of various factors are important in considering needs, and it is difficult to differentiate sharply between research and survey methods. Some years ago when evidence began to appear in support of the infectious nature of pellagra, Goldberger and Sydenstricker[8] began a socioeconomic study of communities in South Carolina. House to house, the living conditions of every family were recorded; housing, family structure, occupation, diet, income. These studies indicated that faulty diet is the essential, primary factor in the causation of pellagra. Yet it remained for experimental research to confirm this finding and to determine the specific nutrients involved. The correlation between the economic status and faulty diet (and the prevalence of pellagra) led to reconsideration of the importance of social factors in the production of disease and the maintenance of health.

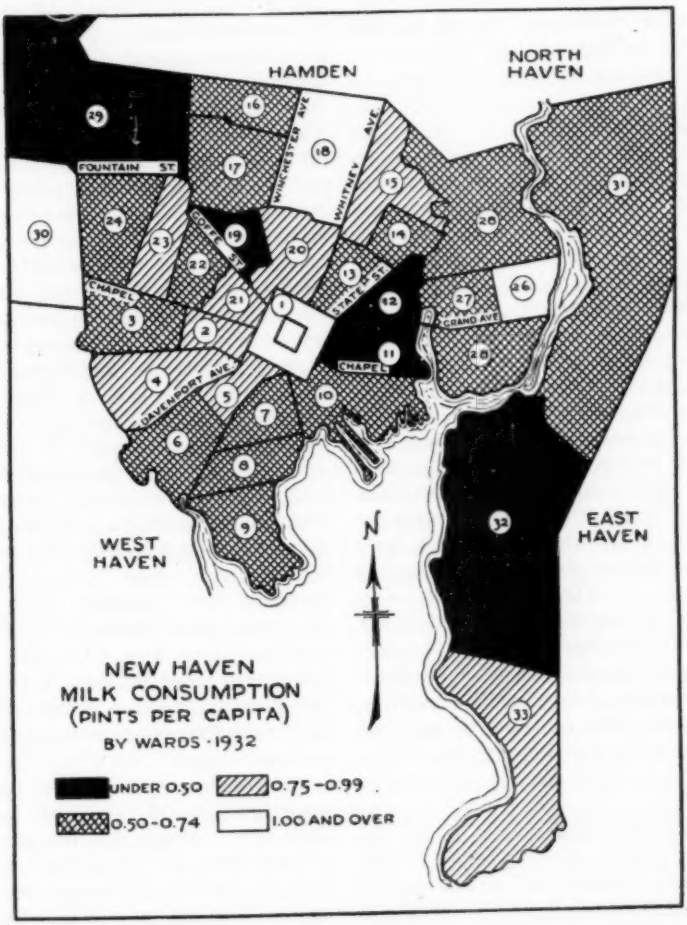
Or, a less refined study may be useful to determine basic problems and variations within districts of a community, as illustrated by a study concerned with milk consumption during the depression in a small city. An educational program to meet a need was begun only after a detailed survey had shown, for the different areas (see fig. 3), where the drinking deficiencies were and the nature of the problem of changing them to surpluses. For each section, racial distribution, proportion of children, and an economic status index were determined, and maps were pre-

pared so that the situation might be visualized. Supplementary information about the use of canned milk, location of schools, child health stations, etc., was obtained. These data were utilized also in a more comprehensive study preparatory to the reorganization of the prenatal care program of the city.

Community Features

In broader terms, in attempting to measure community needs and the efficiency of health service, it is important that those engaged in the evaluation process become familiar with local conditions, the economic, industrial and social factors relating to the population,

FIGURE 3.—Illustrative Methods of Studying the Problems of a City, Concentrating on Districts with Special Needs



the geography of the area, transportation facilities, the characteristics of government. An analysis is desirable of population growth, movement of the population; age, race, and sex characteristics; and trends in mortality and morbidity.[9] Personal contact with those engaged in different phases of public health work and with leading citizens, including personal inspection of work in operation and analyses of records, are among the necessary procedures to be followed. The time necessary for such study will vary with conditions, but a hurried check-up is likely to lead to incorrect impressions and misunderstandings.

Appraisal Schedules

The Pittsburgh survey, initiated in 1907, marked the beginning of a new era in community studies, as it was primarily a social and educational undertaking.[10] The effect of this survey can be traced directly in the community case histories undertaken throughout the United States during the following decade. Then followed in 1920 the formation of the Committee on Administrative Practice of the American Public Health Association, which conducted surveys of administrative organization and health practice in communities throughout the United States, and developed an appraisal form which later was modified to serve as an Evaluation Schedule.* [11] Through the use of a carefully arranged survey schedule the principal needs and problems of the community are brought to light and defined. The program of community service in the several fields can then be analyzed against a background of social and health conditions, and the performance studied in relation to the need, with the result that the relative adequacy of public health work can be judged against the magnitude and type of local problem. The validity of the appraisal form was tested by Philip Platt in 1928 and the evaluation and grading processes have recently been subjected to critical analysis by the staff and committees of the American Public Health Association.

Data assembled are classified according to facilities and resources, to effort and activity undertaken, and to status of accomplishment. Activity reports are analyzed, time studies and other so-called efficiency methods may be utilized, and job analyses made. In qualitative studies especially, case reading will throw light on situations and conditions and point up working relationships. Schedules designed for special purposes may be necessary. It is possible to appraise the effectiveness of a single service such as disease control with reference to need, to consider the total service in reference to balance of various parts of the program, and to give special attention to the impact on an individual, or a family, or a neighborhood. Usually social data require analyses and consideration by both judgment (expert opinion) and statistical procedures. The staff of the American Public Health Association has found that field studies and analyses from the Evaluation Schedule show reasonable correlation for items where numerical and other objective data are obtainable. The evaluation schedule does not permit judgment or adequate consideration of whether limited resources are used to the best advantage.

Items of accomplishment in terms of presumed desirable activities, such as the level of immunization, the percentage of prenatal cases and infants receiving nursing care, the percentage of dental defects corrected, etc., appear to be more sensitive and reliable indices than such indices as mortality rates. Mortality

* This schedule is designed to aid in the visualization of problems and to provide a basis for the evaluation of services rendered. A schedule has also been developed by the National Organization for Public Health Nursing for a survey of community nursing service as a guide to local groups in appraising resources and needs. For early tests of validity, see Philip S. Platt, The Validity of the Appraisal Form as a Measure of Administrative Health Practice, American Public Health Association, 1928.

rates in some instances are useful, as for example, diphtheria and typhoid mortality. In regard to features of tuberculosis control, there is confusion, due partly to the lack of definitions. Some items which do not correlate with features considered "good" in tuberculosis programs are "new cases found per death," "percentage of cases in minimal state," "yield of mass X-ray survey," "percentage of cases on the register visited by a nurse." The death rate appears to be influenced by long-term economic and other social and medical care factors more than by elements of the control program, and does not respond readily to control measures.

There is opinion among some workers in public health that the state of social organization of a community is a greater determinant of its needs for specific types of action than is its vital statistical record. Hence ample attention should be given to what is being done with reference to organization in comparison with the time often spent on such objective measures of health status as cases of morbidity, mortality, and defects (physical examination results). A community survey reviews organized activities according to the three factors: (1) official and voluntary in control; (2) preventive and therapeutic in type; and (3) local, State, and Federal in origin. But information cannot be gathered readily along those lines. To collect information on the status of organized health service in a community, it is necessary to assemble facts, agency by agency, from: (1) tax-supported agencies (official health agencies, and also those with health functions), (2) voluntary agencies (voluntary health agencies, and also those with health functions), (3) economic enterprises (businesses concerned with health, and labor and industry with health functions), (4) self-supported agencies (professional societies and civic and social groups with health functions). After data are assembled on what these agencies are and do, analysis of specific needs can be made as to the 20 or more types of programs of the A.P.H.A. Evaluation Schedule, according to medical care programs (for certain persons, classes of service, and disabilities), and according to research and personnel training. Against a general background of statistical data on illness, defects, and death, deductions may be made as to where gaps and unnecessary duplication exist.

Chronic Illness

The differentiation between methodology of surveys and of research is difficult and perhaps unnecessary, as illustrated by a community study of chronic diseases. It is necessary to gather information about two broad aspects of the chronic disease problem, namely, morbidity and its implications, as expressed by various indices, and medical care facilities. Generally, while data regarding mortality for the community in question are readily obtainable, morbidity rates and related indices are lacking. It would be impossible within the limits imposed by restricted time, money, and personnel to determine these indices accurately. And furthermore, it would be unwarranted, since estimates of sufficient accuracy for the purposes of the survey can be obtained by application to the community in question of indices which have been discovered as the result of previous chronic disease research. Shortcomings in the scope of such measures of disease can be corrected only by expanded research in the epidemiology of the chronic diseases.

Once the disease base of the problem has been determined, it becomes necessary to ascertain the medical care facilities which are available in relation to these illnesses. Medical care is here used in its broad sense to run the "gamut" from prevention to rehabilitation. This step requires a survey and description of all these facilities, since

the small numbers usually involved in each category preclude the use of samples. These facilities are then categorized as adequate or inadequate in relation to the chronic disease needs of the community in accordance with an "a priori" concept of adequacy. The standards of adequacy do not grow out of the survey data but are superimposed upon them from without.

Research into adult health problems in population groups can also be divided, as discussed above for surveys, into two broad categories, i.e., investigation into the epidemiology of the diseases of adult life and investigation into the medical care needs of the adult. Only that research which is related to the epidemiology of the chronic diseases will be discussed here. The occurrence of this and of other types of disease is dependent upon the interaction of the genetically determined organism with its environment. The objectives of research, therefore, are to determine those hereditary and environmental attributes which are productive of disease. This aim can be approached by the collection of mass data and the statistical analysis for possible correlations. Such correlations do not necessarily indicate causal relationships but serve to narrow down the field for more intensive research.

The method might be illustrated by a cancer study which is under way in the Department of Public Health at Yale. This study, using the City of New Haven as its laboratory, aims to discover any correlations which may have existed between cancer morbidity by individual site and inheritance and cultural and economic patterns. Two basic sets of data are used. One group of data consists of ecological material for New Haven developed by Professor Maurice Davie, of the Department of Sociology. The chief source of this material was a family survey of New Haven based upon a sample of 2,000 cases selected at random. This material was checked with other sources of information such as relief records, club membership lists, etc. The second group of data consists of reports to the Division of Cancer Control of the Connecticut State Department of Health of cases of cancer which have occurred in New Haven since 1935. The reports are obtained by a system of voluntary reporting by hospitals. They are augmented, where necessary, by cancer death reports. Except for skin cancers, which are infrequently hospitalized, there is some internal and external evidence that these reports are at least 90 percent complete. Their validity depends upon the level of medical practice in the community. While occasional cases of cancer are never diagnosed as such and are therefore not reported, and occasional reported cases of cancer were in reality not cases of cancer at all, some check on these factors is obtained by the high percentage of confirmatory pathological diagnoses, either by biopsy or at autopsy. In any event, no further check upon the validity of this material is contemplated since no reasonable method for accomplishing it has presented itself. The material thus obtained is being subjected to statistical analysis.

Occupational Health

Comprehensive survey methods for occupational health have already been developed.* In 1934 the Division of Industrial Hygiene of the U. S. Public

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* The modern concept of occupational health implies two overlapping areas of concern:

1. *Protection* of health—provision of services to protect the worker from health or accident hazards peculiar to his occupation which arise out of, or in the course of, his employment. Examples are the control and prevention of occupational accident and disease hazards.
2. *Promotion* of health—provision of adult health and welfare services to ensure for the worker his optimum state of health, productivity, and social and economic adjustment. Examples are the control and prevention of communicable diseases (such as tuberculosis, venereal disease, and acute respiratory disease), the chronic diseases (such as cancer, diabetes, cardiac disease, nephritis, and mental illnesses), and provision of adequate medical care for the worker and his family.

Health Service issued Public Health Bulletin No. 216 entitled "The Potential Problems of Industrial Hygiene in a Typical Industrial Area in the United States."[12] This was a survey of St. Louis, Missouri, conducted in 1933–34. Following the organization of industrial hygiene units in State and local health departments through funds made available after passage in 1935 of the Social Security Act, 15 States made surveys of their potential industrial hygiene problems. In 1940 was issued Public Health Bulletin No. 259 entitled "A Preliminary Survey of the Industrial Hygiene Problem in the United States." This was a compilation of the surveys made in the 15 States, various special studies conducted by the Division of Industrial Hygiene, and related material from many additional sources. While these surveys were concerned primarily with ascertaining the nature and extent of occupational health hazards both in the United States as a whole and at the State and local levels, data were collected also on the services which were provided workers through their places of employment. When the two phases—health *hazards* and health *services*—were balanced against each other, a clear indication was established of the magnitude of the potential industrial hygiene problem. An application of these ideas can be made in community health surveys.

When one appreciates the industrialized nature of life in America, it is perceived that surveys of community health services and needs bring into focus the services which are needed, and the extent provided, through the place of employment.

The approach of the community survey from the occupational health standpoint is the same as that utilized in the determination of the potential industrial hygiene problem. Under the modern concept of occupational health, however, the scope of the survey would be broader in order to give the emphasis merited by the need for adult health services, and those which are provided, at the place of employment. Survey methods, adequately tested, are described in Public Health Bulletin No. 259 (Appendix A, p. 97). Ideally the desired data might be obtained by an occupational health survey of each plant in a community together with the health services provided either at the plant (by management) or at union health centers (labor operated). In larger communities this approach would be impossible, for the usual survey team and a representative sampling of industrial and commercial establishments—adequately representing the types of operation and size of employee group—must be selected for study. Useful data may also be obtained from local health and welfare departments, chambers of commerce, and State industrial hygiene divisions. The attitude toward occupational health services of a representative segment of management and of organized labor should be ascertained. This phase of a community survey should be conducted by one reasonably familiar with occupational health work.

In evaluation of the data obtained from the occupational health survey, it is unfortunate that, as yet, there is no generally accepted basis for balancing the need for occupational health services against the services which may be provided. To be sure, in the field of occupational accidents and injuries, time-proven criteria have been established. The same is true, although to a somewhat lesser extent, in the field of occupational disease hazards and their control. Only meager data are available, however, on which one can evaluate objectively the state of health of the employed population of any community. Particularly in the smaller establishments, statistical data are lacking on epidemiology and morbidity and mortality related to occupations. This need

must be met by extended research studies. Among other schools, the Institute of Occupational Medicine and Hygiene of the Department of Public Health, Yale University, is in process of beginning this type of research study in a group of eight small plants in Hartford, Connecticut, which, since 1946, have had a joint medical service and have maintained an excellent uniform system of health records. In the absence of such information, judgment based on the experience of those in the field, and good-practice criteria developed by management, labor, and organizations interested in the advancement of ocupational health services, must serve as the yardstick.

With the methods available to community health survey teams, and in spite of the shortcomings discussed, it is possible to appraise with reasonable adequacy the occupational health services needed and provided in the modern community. No such survey would be complete without this evaluation.

School Programs

Surveys of school health programs can be approached in different ways, one related to the health status of school-age children and another directed toward a study of the degree to which programs exemplify what is considered good practice according to commonly accepted criteria. In either case programs should be evaluated in terms of the specific purposes for which they have been organized. When these purposes have not been enumerated, it must be assumed that they are comparable to those recommended in the literature. Surveys are aimed at improving programs, and the method used will be selected according to its value in achieving this purpose.

Health status of school-age children can be measured by data that reveal the rate and causes of death; the rate of cases of sickness during a specified period of time and the causes of sickness; the prevalence of such defects as impaired vision and hearing, dental decay, rheumatic heart disease, and orthopedic defects; the rate of children institutionalized because of retarded mental development, blindness, or deafness; the rate and kinds of injuries resulting from accidents; the proportion treated in child guidance clinics; and the proportion found to be undernourished or to have quantitatively or qualitatively inadequate diets. To the preceding may be added information concerning the extent to which children have received preventive treatment for such diseases as smallpox, diphtheria, tetanus, and whooping cough.

In many communities data of this nature are either not too helpful or not readily available. Since mortality during the school-age years is low, mortality data may not be of much help in evaluating the school health program. Data regarding morbidity are unreliable. Information regarding common defects reflects the subjective judgment of the examining physician or dentist and consequently has limited value from the point of view of a scientific analysis of health needs. Despite this limitation, such data with information as to action taken on the findings are needed. Better indices than those mentioned should be obtained and their value estimated.

Difficulties in securing reliable facts concerning morbidity relating to physical and emotional defects or disabilities usually make it desirable to supplement such data with information concerning the school health program and how it is conducted. Information is obtained relating to number and qualifications of personnel of different categories, salary schedules, community relationships, policies established, printed or mimeographed guides or manuals, and type, quality and content of annual reports. Comprehensiveness of the program is determined through information con-

cerning each component part, including (*a*) provision of a healthful environment; (*b*) development of classroom procedures, including teaching methods, that promote mental and emotional health; (*c*) procedures for the care of emergency sickness or injury; (*d*) procedures for preventing or controlling communicable diseases; (*e*) health appraisal; (*f*) health counseling and adequacy of treatment resources; (*g*) health education in both elementary and secondary schools; (*h*) provisions for the education of the handicapped; and (*i*) activities to protect and promote the health of school employees. In each instance activities in these various categories are compared with usual practices or with recommendations in the literature.

Data relating to school health programs may be gathered by experts in the area of school health and health education through observation, interview, and questionnaire. This is the traditional procedure and has brought about desirable improvements in many instances. On the other hand, sometimes a community is not ready to accept the recommendations of experts and the survey report is filed without action. In such instances the survey has little value.

To overcome this potential hazard, self-surveys by school health personnel and local citizens, with advisory assistance from experts, have been tried. This cooperative type of procedure was utilized in a survey of the schools and total school program in Lincoln, Nebraska, by Hill and Brownell.[13] A similar approach was used by the Department of Public Health, Yale University, in surveying school health in East Haven, Connecticut,[14] and is planned for two additional communities. Committees were organized to study different aspects of the school health program, each having representation from the school staff and from parents or community agencies or organizations.

Survey participation by members of the school staff and by representatives of community groups has both immediate and future value. Through participation, individuals gain understanding of the health problems of school-age children and what is being done about these problems. They learn of the agencies concerned with the health of children and the methods that are used to coordinate the health efforts of parents, school personnel, health departments, voluntary health agencies, and professional associations. Perhaps they learn that there is a lack of coordination! Familiarity with health problems and health programs gives them the information they need to formulate, with or without the help of experts, recommendations for action. And since they have been involved in formulating the recommendation, they are more ready to help implement it. Participation in health surveys by lay people helps to develop a better-informed group that can take future leadership in bringing about necessary program improvements.

Rheumatic fever is of special concern to school and to other community groups. Illustrative questions used in determining community needs in case finding may be taken from a schedule in a survey of a rheumatic fever program:

(1) How many cases has the rheumatic fever program agency discovered as a result of thorough screening or survey (in school or by private physician) of children who would otherwise not have been examined? (This includes family contacts.)

(2) How many previously undiscovered cases of rheumatic fever or rheumatic heart disease came to the attention of the program or other medical agencies and private physicians, as a result of the program activities?

(3) How many of these newly discovered cases needed:

(*a*) Active treatment and management.

(*b*) Modified activities.
(*c*) Vocational guidance and rehabilitation.

Neighborhood Studies

In planning the district health program for New York City, a series of studies was undertaken on the suggestion of the late Edgar Sydenstricker and in collaboration with Dorothy Wiehl and others, dealing with the population, health conditions, health facilities, and services in a particular district.[15] Various study methods were used including detailed analyses of census and vital statistics data (see figs. 4–8), examination of available records, use of the American Public Health Association appraisal form, and special surveys to obtain through home visits sampling observations of family problems and services received. The first step was the collection of available information as to the health needs of the population and the existing health facilities and services in this district. Special data were obtained from the Census Bureau on race, color, nativity, number and size of families, home ownership, value of homes, and rentals. Use was made of previous surveys and reports of the Department of Health, and this information was supplemented and brought up to date by further analyses of the organization and services rendered by the different bureaus and divisions in a year, through personal interviews with bureau and division directors. Detailed information was also obtained on the services rendered in the district by official and voluntary agencies.

As previously noted, mortality data and the incidence of notifiable diseases do not reveal all the problems of a population nor do statistics of the volume of services rendered describe how

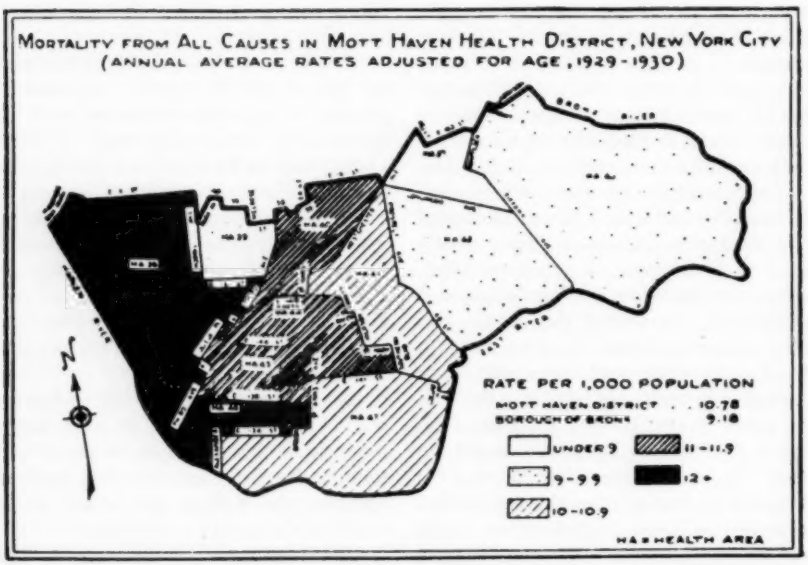
MORTALITY FROM ALL CAUSES IN MOTT HAVEN HEALTH DISTRICT, NEW YORK CITY
(ANNUAL AVERAGE RATES ADJUSTED FOR AGE, 1929-1930)
RATE PER 1,000 POPULATION
MOTT HAVEN DISTRICT . . 10.78
BOROUGH OF BRONX . . . 9.18
UNDER 9
9-9.9
10-10.9
11-11.9
12+
HEALTH AREA

FIGURE 4—Mortality from All Causes, per 1,000 Population in the Mott Haven District of New York City, by Health Areas (Annual Average Rates Adjusted for Age, 1929–1930)

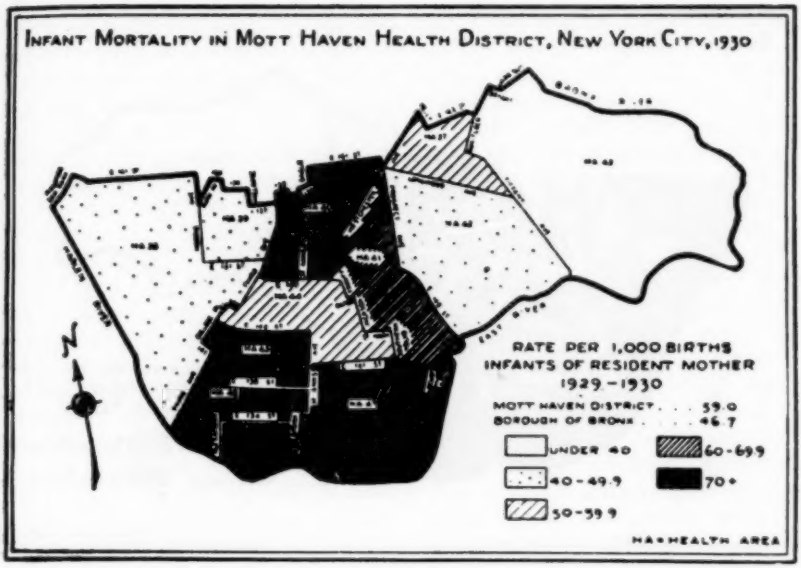

FIGURE 5—Deaths of Children Under One Year of Age, per 1,000 Live Births (Infant Mortality), by Health Areas, in the Mott Haven District of New York City, 1930

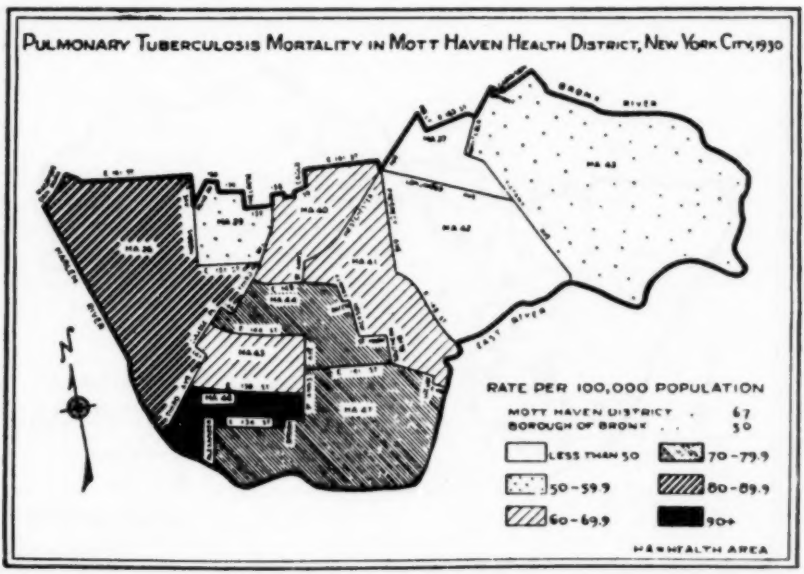

FIGURE 6—Deaths from Pulmonary Tuberculosis, per 100,000 Population, by Health Areas, in the Mott Haven District of New York City, 1930

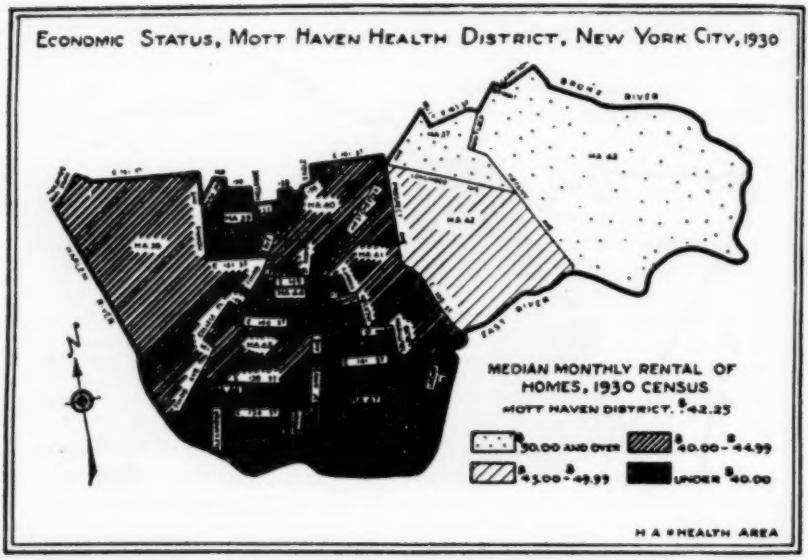

FIGURE 7—Economic Status, as Indicated by the Median Monthly Rental of Homes, in the Mott Haven District of New York City, by Health Areas, 1930

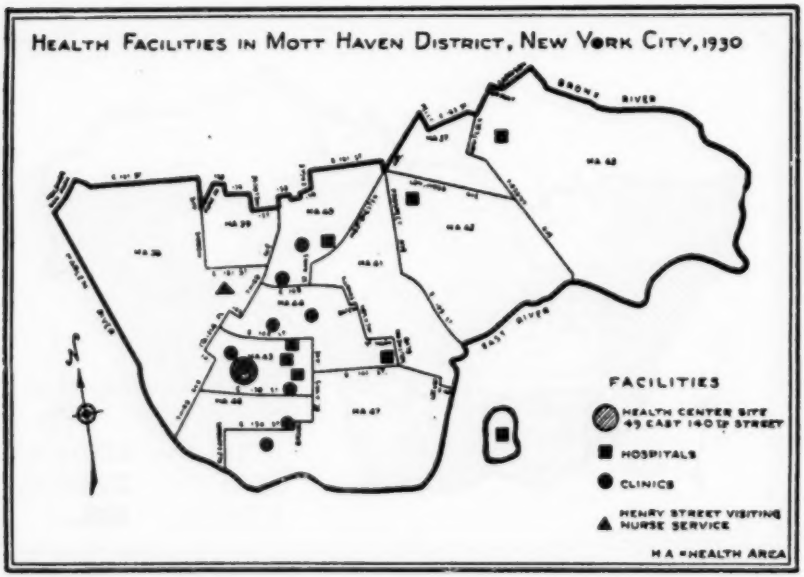

FIGURE 8—Distribution of Health Facilities in the Mott Haven District of New York City, by Health Areas, 1930

these services were related to specific needs of individuals. By means of a special survey of a random sample of 1,000 families, an attempt was made in the Mott Haven District to obtain more information on how the various activities of the Health Department and those of voluntary agencies were distributed in the community and on the actual services rendered for the care of various health problems. The families were visited by a special investigator and the information collected was of the following types: roster of family and age of each individual, place of birth and education of both husband and wife, approximate income in preceding 12 months, rent paid and description of housing conditions, illness and disability, source of medical care and all other health care in preceding 12 months. Data on the health needs of families not receiving any services as well as for those with services were obtained. The relation of the preventive and educational services rendered to the specific health problems and other conditions observed in the families gives some indication of the adequacy of the services. Such information may be used in guiding the improvement of the program, and the data collected also provide a base line against which improvement in the service under the district administration may be measured.[16] In various forms, these procedures have been used effectively on a city-wide basis and in districts in New Haven, in studies of hay fever, of chronic illness, and of other problems.

Another sampling method has been utilized recently in Philadelphia for securing essential data regarding such critical indices of service as level of immunization and medical and public health nursing services to antepartum mothers and to infants.[17]

There are many questions to be considered before a survey is undertaken. Millions of dollars have been spent, and continue to be spent, on surveys of health and welfare agencies and of community needs. Leadership, time, and energy are required. Among the recurring questions are: What is the purpose of these surveys? Who wants them? What do they accomplish? Are they worth the cost? Are there other devices which might prove to be as effective and less costly? Is the community prepared for the study? What is the result in meeting the needs of the people of the communities concerned? If the purpose of a survey is to reveal unmet community needs, as well as the extent and quality of work in already existing services, all the groups concerned with the survey should recognize in advance that genuine research into community social problems and an evaluation of the many facilities for meeting needs will be necessary.[18] Occasionally a study reveals acute problems and results in constructive action. Factual information, assembled, analyzed, and interpreted, is the basis on which advances are made in medicine, agriculture, industry, finance, and other fields.[19] Surveys can be an educational experience for a community—even when the general conclusions could have been anticipated from findings in other places. Administrative and other forms of research will provide the basis for planned action.

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Discussion

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THESE four papers present a wide spectrum of objectives, subjects, and methods. Discussion of them, particularly in this setting, involves trepidation and a considerable feeling of inadequacy. I shall seek your indulgence in thinking through some of the difficulties.

This conference is announced on the subject of "Methods in Public Health Research." Webster says that research is "(1) a searching for something, especially with care and diligence, (2) careful or critical examination in seeking facts or principles; diligent investigation." Without precisely defining public health, it seems pertinent to note that this discussion assumes that public health is a social science having a background in and based to a large extent on the natural sciences. Thus we might expect to find diligent investigation both among the exact sciences and in the broader social phenomena.

This morning the subject is "Methods in Evaluation of Community Health Problems." We are to examine methods of taking stock, of appraising "health problems." As Dr. Lowell Reed has pointed out in "Backgrounds of Social Medicine," [1] published by the Milbank Memorial Fund, when we use the term "health" we imply our modern concepts of "positive health" although we have few means of classification other than those dealing with ill health and disease. We also immediately become involved in socioenvironmental factors which require consideration both of the physiology of individuals and the complex variables in a specific population group. We must deal with people and all that that implies.

There are many things about these problems and this conference which remind us of Sir William Osler's essay, "The Old Humanities and the New

Science."[2] You recall that Dr. Osler was chosen to preside over and give the annual address of The Classical Association of Great Britain. I am sure we could use here today the incomparable skill and sly humor which he brought to the problem of bridging the gap between the classicists and the humanists.

As we get down to the detailed consideration of this morning's papers, one basic problem stands out, it seems to me. It is related to the eternal problem of evaluation, which in simple language is "how much credit can be given for effort," and to the basic hypotheses on which the projects and reports are based. The papers appear to make extensive use of the kind of hypotheses in which we say that, given certain facilities and measurable effort, certain desirable results are accomplished. We often cannot measure the accomplishment by satisfactory methods, but we can measure the facilities and the effort. We are all aware, of course, that most routine evaluation procedures measure effort alone.

A simple example in which the hypothesis has been fairly well tested by specific detailed research is in regard to the level of immunization of a particular group. We can fairly safely assume that a high level of immunization will control diphtheria. On the other hand, we know but little about the precise benefits obtained from public health nursing visits to a unit of population.

Mr. Moore and I arbitrarily divided the papers with regard to detailed consideration and so I should like to comment on Dr. Hiscock's and Dr. Pullen's.

Dr. Hiscock directed our attention and stretched our thinking from individuals to the community. He emphasizes the place of survey methods in providing data for diagnosis of social pathology, enabling us to recognize significant correlations and to test some of the hypotheses on which much administration and expenditure of funds rest.

Both Dr. Hiscock's and Dr. Pullen's papers include the education and motivation of people among the major objectives to be achieved. Both are interested in seeking new knowledge and new patterns, and both are interested, at the same time, in having people change their behavior. There can be little doubt that the combination of seeking facts and motivating people greatly influences and interferes with the seeking of facts which I think we can properly call research. It slows up the process, often distorts the results. On the other hand, except in the most unusual circumstances, when people participate in any survey or research project they will be educated or changed in some way, good or bad, and to a greater or lesser degree. The lesson seems to be that, in the great majority of instances, research projects involving people must consider this aspect; and, on the other hand, the opportunities for research must be diligently sought in surveys which are primarily for problem solving and social change. It is clear, too, that improved survey and evaluation techniques depend on the testing of many working hypotheses by more refined research. Dr. Hiscock had a significant sentence in this connection. He said, "Correlations determined in this way [that is, by collection of prevalence and incidence data and relating it to socioenvironmental factors] do not necessarily indicate causal relationships but serve to narrow down the field for more intensive research."

Another phase of Dr. Hiscock's paper is that a multidiscipline approach is stressed. The use of qualified teams representing a variety of training and backgrounds has advanced these methods and results. Dr. Pullen's project, although in the area of medical care and medical education, deals to a very large extent with the motivation of physicians,

their relations with their patients, and with education in the social fields as well as medical knowledge and skills. It is quite possible that medical disciplines alone are not adequate to measure effectively or even recognize the details of the actions involved.

Dr. Pullen's first paragraph is an excellent example of the type of hypothesis referred to above. He says, and I paraphrase his words, that it is reasoned that, if more complete diagnostic facilities, consultations, etc., were provided, improvement of medical care would result. Some of the measuring sticks are the availability of the facilities and their use (that is, the efforts expended), although attempt is made to correlate them with indices of sickness. This type of reasoning is also applied in the decision to concentrate on meeting the needs of the physicians rather than the needs of the population. The obvious premise is that, given better-equipped physicians with motivation to use the facilities, rural medical care will be improved. I am not questioning the premise. My point is that fundamentally we must recognize these as hypotheses and test them by separate detailed research in order to use such indices to measure medical care or any other health problem. We would need to know what the term "medical care" is to include. We should then be able to select some particular detail and test before and after the project, or by means of a control group, to determine if there was some accomplishment. Without trying actually to select such indices, perhaps maternal mortality or school days lost from pertussis might be analyzed. On the positive side some families might be studied for increase in number of days at work, or rate of growth among groups of infants and children. If we could successfully demonstrate that better-prepared physicians with adequate facilities accomplished these results, we could subsequently evaluate the qualifications of the physicians by ascertaining the relatively simpler data relative to their educational backgrounds and their use of facilities such as laboratories, hospitals, and consultants.

If a suggestion of method is in order, it would seem that if Dr. Pullen's and Dr. Hiscock's methods were combined, the Tulane project would be considerably strengthened. Some elements of the basic hypothesis may be susceptible to more precise measurement as Dr. Pullen inferred.

We are attempting to explore this morning an enormously broad, difficult, and in a sense, new field. In many ways it is discouraging and frustrating, particularly to those whose training is primarily in the exact sciences. Osler's essay helps us in this regard. He says "Think of the Cimmerian darkness out of which our generation has, at any rate, blazed a path!"[3] He also reminded the classicists who, like this group of scientists, were few and very highly trained that, "Though small in number, your group has an enormous kinetic value, like our endocrine organs."[4]

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Discussion

FELIX E. MOORE, JR.

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THE letter of invitation to the discussants on this program contained the following instructions: ". . . you are asked to focus your discussion entirely on the methodological aspects rather than on the findings of the papers to be presented. It is hoped that you will describe, in relation to the objectives of the study, the techniques for ascertaining the accuracy and validity of observations, the design of sampling procedures used, the methods of evaluating, the factors essential to sound results, and the selection of experimental and control groups. Discussions are to be limited to 20 minutes each."

That's a large order—one which your discussants felt with full force after we had received advance copies of the four meaty papers which have been presented here this morning. Therefore, as Dr. Kandle has stated, we have agreed to divide the task, and I will, accordingly, confine my remarks to the papers by Dr. Hubbard and Mrs. Pennell on the Survey of Pediatric Services, and by Professor Kaplan on the Evaluation of Health Education Activities.

The Survey of Pediatric Services is perhaps the largest survey undertaken in the health field since the National Health Survey of 1935–36—its total cost was over a million dollars.[1] It should be remembered that the paper by Dr. Hubbard and Mrs. Pennell reports on only a small part of the total survey, namely, the estimation of the total amount of services rendered to children by doctors, hospitals, and community health agencies. The magnitude of the task undertaken by those responsible for the administration of this survey is almost overwhelming. They worked with 50 local jurisdictions in setting up the survey on a decentralized basis, and questionnaires were mailed to over 116,000 physicians, in addition to those sent to dentists, hospitals, and other health facilities. When they state that "the vastness of the study's scope and its decentralization . . . gave rise to enormous difficulties," I am sure that they are indulging in understatement. In spite of these difficulties, a complete report was published in book form within 3 years of the time that collection of the basic data began.[2]

From the standpoint of the immediate interests of this audience, however, an even more impressive result of the work of this group is the publication, separately, of an extensive report on methodology.[3] With 50 pages of text, reproductions of all forms used, and 161 tables, this report contains a step-by-step analysis of the activities of the survey. It describes in detail the methods used in collecting the data, and also the methods of estimation used to correct for missing or faulty data. The publication of such a report is good research methodology. It is elementary, perhaps, yet it is often overlooked in surveys of this type, since enthusiasm, and funds as well, often wane rapidly after the basic report has been written.

It is not easy to comment briefly on the specific methodology of this study, because of the multitude of interesting methodological problems that invite attention. It is not difficult, however, to picture one of the main dilemmas that was encountered in working out the basic design. Data were wanted for

individual States and counties (or, at least, groups of counties). Moreover, it was undoubtedly considered expedient to place responsibility for data collection in the hands of local groups. The decision, at least with respect to coverage for individual physicians, was to conduct a full census by mail questionnaire. The result, as the technicians undoubtedly foresaw, was incomplete coverage, with a mean return for the country as a whole of 64.9 percent, and a range among individual States from 44.0 percent to 84.9 percent.

Bias in response to the questionnaire was suspected to be related to the amount of services provided, and this supposition was confirmed by a well-designed follow-up survey in four States. This survey was based on an area sample design and information was secured by personal interview. It is important to note that this survey established that bias was present in the original results even though there were only small differences between the respondent and nonrespondent groups with respect to anything that could be measured "a priori," namely, age, sex, race, or hospital training. It was with respect to facts that could be measured *only by the survey itself* that the nonrespondents were unrepresentative. The net result of this analysis was that data from the four-State sample follow-up were used to derive over-all correction factors which were then applied to appropriate size-groupings of counties within each State. This critical evaluation of the validity of the data is, again, good methodology.

Now comes the difficult part of this discussion. Is it fair for the research technician, protected by the safe irresponsibility of hindsight, to inquire into the possible alternative designs for a survey of this type? I hope that this is the kind of meeting where we can do that.

The main study was, for the most part, carried out without obvious sampling, that is, an attempt was made to obtain data from every element in the universe of study—physicians, hospitals, etc. (There was, of course, time-sampling, in that data on only a single day's experience were secured from each physician.) I assume that the decision to try for 100-percent coverage was based on the desire to have data available, not only for each individual State, but for counties and possibly cities as well. What was the result? The data obtained were actually based on a 65-percent "sample" (on the average) which contained serious bias. This bias was corrected by weights calculated from a very small sample from four States, the results of which may not, in fact, be applicable outside those States. And it is not, I believe, possible to estimate the sampling error of these weighted figures.

Might it not have been preferable to have attempted less at the beginning—to have designed a series of State samples which would have yielded results of predictable sampling error for States and groups of counties, if not for individual small counties? If less extensive coverage had been undertaken, more intensive follow-up might have been feasible.

We can assume, I believe, that good follow-up, by personal interview if necessary, could have raised the rate of response to the questionnaire above 90 percent. If that had been the case, then even relatively small samples would have yielded more reliable estimates both for States and county groups than were obtainable by making corrections which could not in any event be applied to all cells in the break-down of the data.

Not only could this design have yielded more reliable results, but it could have yielded savings (including the cost of the four-State follow-up study) which might have been devoted to more intensive studies of the problem. I think we would all agree that the number of

visits to physicians per 1,000 children per day is at best a very crude measure of medical care. Perhaps an intensive small sample national survey, based on personal interviews and carried out simultaneously with the large-scale survey, would have yielded much more extensive data on pediatric care for the country as a whole. The more limited local data might then have been more meaningful in the light of the more extensive national data.

But this sort of speculation on what might have been done would be completely out of order at this time, if we did not try to abstract some more general principles which would serve as future guides in similar situations.

As I see it, the important question in the designing of almost any survey of this type is, "How much information of what quality will X dollars buy?" It is the responsibility of the consumer to state how much information he needs, and how much he is willing to pay for it. It is the responsibility of the technician to state how much information he can deliver of what quality, for the set amount. At that point some compromises must almost always be made. At times there must be compromise on coverage—X dollars will not buy extensive geographical or other type of detail of any reasonable quality. At times there will be compromise on quality, with a clear understanding on the part of all that attainable quality will be sufficient for the problem at hand. Under these conditions the technician must be prepared to offer a number of alternative designs, varying in coverage and in quality. He must be prepared to approximate 100-percent coverage if the uses of the data require it. He must be prepared to sample, with possible sacrifice of detail, in order to maintain quality for a given cost. Sometimes he must be prepared to recommend that no study be carried out if neither quality nor coverage can be adjusted to fit the cost, nor cost adjusted to minimum standards of quality and coverage. In a sense, however, all these are negative considerations. The technician, if he is to make a creative contribution, must at times be prepared to show how more information may be obtained for less than X dollars when the consumer has incorporated what may be for him expensive luxuries in his original specifications. Thus small sample coverage may often give more information with smaller total costs by making possible: (*a*) better quality of data collection at the source; (*b*) the collection of more data from each source; (*c*) availability of interrelated data from several sources; and finally, (*d*) more detail, more quickly, per dollar of processing cost.

We should turn now to Professor Kaplan's paper on opinion-polling techniques. While we reach it last in this discussion, it has, from many points of view, as important methodological implications as any of the papers read at this session.

A good case may be made for the point of view that the development of a science proceeds through three steps: first, classification; second, measurement; and third, controlled experimentation. As has been indicated in Dr. Hiscock's paper, the social sciences, including public health, have developed to the point where much in their fields of interest is measurable—often with an exactness which, for all practical purposes, is as good as that of the physical sciences. You will recall Dr. Scheele's comparison of the precision of estimate of the number of physically handicapped persons and the bacterial content of milk.

Almost all workers in the public health field have learned by experience that attitudes and opinions are very real factors which must be taken into account in the planning of any public health programs. There has not, perhaps, been such wide agreement that

these facts of attitude and opinion can be subjected to fairly precise measurement. There are still some public health administrators who would not dream of attempting to deal with, say, tuberculosis, without the aid of the microscope, the X-ray, and other laboratory aids, but who, nevertheless, prefer to steer by the seat of their pants when it comes to dealing with human attitudes. That sort of thinking, I should explain to Professor Kaplan, is not likely to be found in this group.

His paper shows us first, then, how a specific technique of attitude measurement can be brought to bear on a number of problems which are of immediate practical importance. A particularly apt illustration is the discussion of the research on the mass X-ray situation with the finding that it is the older group which shows the least interest. The consequence for policy is the attempt to aim an information program at this group.

This brings us to the real methodological meat of Professor Kaplan's paper—the evaluation of health education programs by means of controlled experimentation. It is here that the social sciences begin to approach the stage of development of the natural sciences, and it is here that more work must be done if those who are skeptical of the achievements of the social sciences are to be convinced of their value.

The present paper mentions only one experimental design, in which the study group of 2,700 persons has been broken down into control and experimental groups, equated as to characteristics. While the community education program on periodic physical examinations will reach both groups, the experimental group will receive special materials by mail and otherwise, and differences in change in attitude and behavior in the two groups can then be measured. We will look forward with interest to the results of this experiment.

Along with our interest in the development of experimental methods in this field, we must recognize that the methodological problems are great and progress will necessarily be slow. Dr. Carl Hovland [4] has pointed out that we must first develop our tools of measurement, and this, I take it, forms the major portion of the present work on the San Diego study. The sample of people whom we study must be representative of the group which we wish to reach. The material to which they are exposed must be representative of the material which we expect to use. The situation in which the study is done must be representative of situations actually encountered in practice. And finally, the measurements which we make must reflect real behavioral changes. If all these criteria are fulfilled, we must recognize that our generalizations may still have limited application.

The study which Professor Kaplan briefly mentioned appears to conform to these criteria. I think we should all hope to see more such experimental designs incorporated within the San Diego study.

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METHODS IN THE EVALUATION OF DIAGNOSTIC AND THERAPEUTIC TECHNIQUES

Major Claude M. Eberhart, M.C., Chairman

The Efficacy of Nasopharyngeal Irradiation for the Prevention of Deafness in Children*

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JOHN E. BORDLEY, M.D.

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IN the fall of 1948 a study was initiated in the public schools of Baltimore to determine the efficacy of nasopharyngeal irradiation for the prevention of deafness in children. The present discussion is in no sense an analysis of the rationale and findings related to this work; it is limited specifically to the consideration of certain methodological aspects of the project in order to suggest ways and means of meeting various problems of validation and control.

Orientation

For many years, extensive laboratory and clinical work with nasopharyngeal irradiation has been carried on in the Johns Hopkins Hospital, in treatment of fliers and submariners during and since World War II, and in various private medical centers and public health clinics. The evidence indicates that the presence of infected lymphoid tissue in and around the pharyngeal orifices of the Eustachian tubes may lead to damage to the structures of the middle ear; this damage, often repeated, may cause irreversible impairment of hearing. This excess lymphoid tissue can be safely and painlessly removed by irradiation with a nasopharyngeal applicator containing radium salts or radon gas; such treatment neither requires hospitalization nor interferes with the daily routine of the individual. Lymphoid hyperplasia in the nasopharynx is common among children, and there is good reason to believe that if symptoms indicative of a predilection for damage to the middle-ear structures can be recognized early enough they may be reversible by irradiation, thereby preventing at least a significant amount of hearing impairment associated with upper respiratory conditions.

Heretofore there has been no controlled study of the effectiveness of this treatment in children. Related problems are early diagnostic recognition and the effect of pubescent changes in the anatomy and physiology of nasopharyngeal lymphoid tissue. This treatment has not been demonstrated in detail

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as a preventive measure, nor is there definitive information about its cost as a preventive measure at the public health level. Answers to these questions are the specific objectives of this study.

Plan of the Study

The general plan of the study is as follows: a representative group of a large number of school children is surveyed for hearing impairment, which is determined by audiometric measurement and supported by otologic observation; according to determined criteria a statistically significant number of these children is selected to compose the study group, which is subdivided into an experimental and a control group, between which the only differential is the employment of a standard course of nasopharyngeal irradiation; the entire study group is reexamined at least twice each year over a period of 5 years; in the fifth year the entire group included in the initial survey is reexamined and comparative findings are tabulated. All the work is carried out in the schools by well-trained field teams. If the symptoms warrant, treatment by irradiation will be repeated after a suitable interval, during the course of the study.

Design of the Sampling Procedures Employed

Audiometric and otologic examination will screen out between 15 and 20 percent of any large group of children of elementary-school age, and it was believed that about two-thirds of the screened group would be eligible for the study group. It is estimated that between 500 and 600 children should compose the study group and, therefore, that the survey group should number approximately 5,000 children.

From the beginning, the study has been organized and administered as a cooperative project with the Baltimore City Departments of Health and Education, and all planning has been carried out jointly with representatives of these organizations. It was decided to conduct the initial survey at the third-grade level, where the children averaged age 8; the children would thus be old enough to cooperate in routine examination procedures and young enough so they would be expected to remain in the school system through the 5-year period; moreover, the study would extend through the period of puberty. It was further decided that the survey group should be composed of white and Negro children in a ratio of 2 to 1, this being the proportion in the public schools of Baltimore. When the survey was undertaken there were approximately 7,000 white children and 4,000 Negro children in the third grade. A total of 5,456 children, almost exactly 50 percent, comprised the survey group. This number of children involves a distribution of 54 schools, and includes all third graders in each of these schools at the time of the survey. The detail of the selection of schools was worked out with the personal advice and direction of the Assistant Superintendent and the Director of Elementary Education, who made the selection on a basis of general geographic distribution to represent a cross section of the city in terms of social and economic status. This method of determining the structure of the survey group provides an adequate sampling for the study.

Methods Employed to Maintain the Accuracy and Validity of Observations

Special attention was given to the scope and method of audiometric measurement. Two special, mobile, sound-treated booths were designed and constructed. They provide enough attenuation so that in ordinary circumstances the ambient noise inside the booth is less than 40 decibles (ref. acoustic zero). With the additional attenuation obtained by the use of a

blank headphone covered with a doughnut-style pad over the ear opposite to that under test, the test situation in the field is well within the limits required for accurate clinical audiometry. All field conditions are checked at regular intervals with a standard sound-pressure-level meter.

Two standard commercial portable pure-tone and two portable speech audiometers are employed. They meet the current requirements for performance of the National Bureau of Standards; they are calibrated daily in the field for normal-ear performance, and are calibrated electrically at least twice during the school year.

Particular attention has been paid to the selection and training of field personnel. Each field team is composed of an otologist, a public health nurse, an audiologic technician, and a secretary. Two field teams are used during the first and fifth years, one during the intervening 3 years. Members are trained both individually and as a group before they are assigned to the field. Considering the fact that to date the number of incidents with uncooperative children has been entirely negligible, one may observe that special attention to the selection and training of field personnel pays good dividends.

Because of the importance of the initial nasopharyngoscopic examination and the initial radium treatment, this phase of the study was carried out by 10 staff associates of the Department of Otolaryngology, all experienced ear-nose-and-throat specialists who have used these techniques for many years in their private practice. These men volunteered their time and skill to maintain a high level of technique and accuracy in nasopharyngeal inspection.

Selection and Handling of Control and Treatment Groups

Preselection of the study group was made on the basis of findings in the otologic and audiometric examinations of the initial survey. Children whose tympanic membranes were not observable, or could not readily be made observable by cleansing, were excluded from candidacy in the study group. The initial audiometric screening consisted of determining the acuity of each ear at threshold for four frequencies—1,024, 2,048, 4,096, and 9,747 c.p.s. The criteria of preselection were established as follows: a hearing loss below normal of 15 decibels for two tones in either ear, or of 20 decibels or more for one tone in either ear. These performance levels are considered diagnostically significant of the sort of impairment under scrutiny, and are sufficiently rigorous to rule out most transitory reactions of inattention or other deviant behavior at the time of screening.

After the initial survey was completed, all children meeting these criteria were reexamined. They were tested by pure-tone audiometry to threshold across the standard 6½-octave range from 128 to 9,747 c.p.s., were reexamined for ear-nose-and-throat symptoms, and were examined with the electric nasopharyngoscope to determine the status of lymphoid tissue proximal to the tubal orifices. The necessary anesthesia was obtained with a standard solution of 1 percent pontocaine introduced with an applicator. Children with acute upper respiratory symptoms at the time of this reexamination were excluded.

Children whose symptoms met the required criteria, and who were found to have lymphoid hyperplasia in the region of the tubal orifices, were admitted to the study group. The course of nasopharyngeal irradiation was begun immediately at the time of reexamination. Selection for the treatment and control groups was made by random alternation. The actual physical handling was and is the same for the children in both groups: those in the treatment group are treated with a standard

50 mg. monel-metal radium nasopharyngeal applicator; those in the control group are treated with a dummy applicator. The standard course of nasopharyngeal irradiation is three applications bilaterally, 12 minutes each, at 2-week intervals. Not more than two courses of treatment are to be given to any child in the 5-year study.

The children in the treatment and control groups are examined in detail for speech impairment, and for speech-hearing losses as measured by responses to electric phonographic recordings that are duly standardized and calibrated. Every child in the two groups is reexamined for otologic symptoms and for pure-tone audiometric thresholds at least twice each year during the study; through this 5-year period, a full record is kept of any collateral treatment of the upper respiratory system.

Methods of Evaluating and Controlling Essential Factors

Several factors in the design and execution of the study have already been stressed. Every effort has been made to maintain an adequate environment for testing. Selection for the study group was made in terms of retest performance at threshold values of auditory acuity; this last should give reasonable insurance against faulty inclusions or exclusions, so far as the study group is concerned. Without doubt, some of the children in this group have impairment that is of a nerve type; presumably, this is irreversible by irradiation. Yet all children included in the study group show evidence of lymphoid hyperplasia which may contribute a conductive element to the auditory impairment. It will be remembered that we are dealing here with a possible preventive measure, and that many of the cases picked up by the techniques described would be subclinical by all ordinary standards of otologic practice. One of the major points of the study is to learn the significance of diagnostic symptoms in preventive terms.

A special device has been employed to maintain the integrity of observations. The applicators, loaded and dummy, are masked and color-coded, and none of the otologists handling the children knows whether the treatment involves radium or a placebo. Both sets of applicators are stored in specially designed lead carrying cases, and all are treated with respect. Without knowledge about the administration of radium for any individual child, the field otologists are freed from any strictures or predilections which might influence their observations regarding the changes in lymphoid tissue in the nasopharynx.

The design of this study implies that the field data be handled in two separate categories: (1) data from the initial and final surveys, relating to the entire group of 5,400-odd children; (2) data on the selection, treatment and follow-up of the study group. Both groups of data are recorded in the field directly on mimeographed forms designed and coded so that all findings may be transferred directly to I.B.M. cards.

Codification for the screening survey involves 31 columns, including the necessary biographic data; specific information on the condition of the ear, nose, and throat; pure-tone audiometric thresholds; and an appraisal of the child's speech. This information for the whole group of children will be compared with the data in the same categories that are obtained in the resurvey in the fifth year. It is hoped that this comparison will help to determine the significance of physiologic changes in the nasopharynx brought about from maturation through puberty, and from adenoidectomy, where pertinent, and will help to determine criteria adequate for diagnostic guidance in the prevention of hearing impairment.

Codification for the study group involves 50 columns, including more

specific data and special data on previous treatment or treatment other than irradiation received during the course of the study. Particular emphasis is placed on detailed observations of the condition of the tubal orifices, the presence of adenoid tissue, audiometric findings for both pure tone and speech, the child's speech habits, and his progress in school. It is hoped that this controlled study will finally specify the efficacy of nasopharyngeal irradiation as a means of preventing hearing impairment related to changes involving lymphoid tissue in and around the eustachian orifices.

Special Problems

One factor important for successful prosecution of this study is the attitude of the cooperating public agencies and the attitude of what might be called "the public mind" toward such work. For obvious reasons, without the full cooperation, participation, and public relations of the city departments of health and education this study could not have been initiated, let alone carried out. And the importance of this departmental sharing cannot be over-emphasized. At every stage of planning and execution, representatives of these two agencies have incorporated their efforts with ours from the level of Commissioner and Superintendent, through school-health personnel, administrative and field, principals, classroom teachers, and parents. Only one primary safeguard was required by these public agencies: that no child's chances for improved health would be jeopardized by inclusion in the control group. It was fully agreed that ". . . if, in the control group, the pathologic condition develops to the point where under present conditions treatment would be indicated, treatment would not be withheld to the disadvantage of the child." This "point" will be determined by regular reexamination during the course of the study; it is assumed that any child who shows progressive symptoms, and who has not received radium, will have demonstrated the main objective of the scrutiny and can therefore readily be admitted to the treatment group.

One additional problem should be mentioned. Many difficulties are presented by acute illness and absenteeism among the children in the study group. Irradiation is contraindicated in the presence of acute cold symptoms, and there has been a high incidence of upper respiratory infection this past winter. Audiometric examination is undertaken only when children are symptom free and every effort is made to pick up the absentees as soon as possible within the cycle of repeat examination; a few have been lost from the study group.

Conclusion

It is hoped that this discussion has served to emphasize the highlights of design and methodology in this study of the effects of nasopharyngeal irradiation in preventing deafness in children. The point of the study is to derive data, based on controlled performance in a typical metropolitan area, that will be helpful in evaluating the use of this treatment on a much larger scale. This procedure involves both techniques and per capita costs. Without an established method for the selection of children likely to develop impaired hearing from causes related to lymphoid hyperplasia, a preventive program could not possibly be set up on a large scale. To wait until a child may develop an early impairment that is pervasive and handicapping before considering irradiation might rob many children of a chance for future normal hearing; and to irradiate every child showing lymphoid hyperplasia would be a hopelessly involved task. Objective data are needed to guide the choice, and it is believed that this study will produce the necessary data.

Plan for the Evaluation of Vaccination Against Influenza*

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Basic Considerations

THE readiness with which the effect of a possible prophylactic or therapeutic procedure can be demonstrated in a given disease is related in no small measure to the prevalence of the disease; to the clarity of the clinical manifestations, their severity and duration; and to the case fatality. Influenza has not been a disease sharply identified clinically by most physicians, because the signs and symptoms may be encountered at the onset of a variety of illnesses; because it is ordinarily of but a few days' duration; because in most years the disease is mild and the case fatality quite low. In fact, its epidemic behavior is one of the most commonly employed diagnostic criteria, but in this behavior the disease is not necessarily uniform in distribution. Furthermore, influenza is not a single immunologic entity and immunity is not permanent.

Studies by various investigators had earlier furnished opportunities for appreciating certain of the difficulties and pitfalls to be considered in seeking an evaluation of vaccination against influenza.

Population.—Apart from being homogenous, the population should be sufficiently stable to avoid unbalancing an intended pattern by shifts. It should be sufficiently large to provide data adequate for evaluation and, estimating an incidence of 10 percent, groups should be not less than 1,000 in number. It should be of a nature that would permit close, continued observation within the capacity of the investigators. It should be of a type that would permit the establishment of adequate controls and would allow the procurement of sufficient specimens for the necessary laboratory investigations. If possible, it should avoid the theoretical bias presented by a comparison of volunteers receiving the test material with a nonresponding group as controls.

Vaccine.—Since it was not known whether influenza A or B would be encountered, the vaccine obviously had to include both antigens. The vaccine also had to contain sufficient virus to ensure a good antibody response. Since the duration of effect was not known, vaccination had to be carried out reasonably close to the period in which epidemics most commonly occur.

Investigators and procedure.—The members of the Commission on Influenza had extended experience with the clinical and laboratory aspects of influenza; hence, the arrangements could concentrate on obtaining agreement in the procedures to be followed as to clinical classification, uniformity of procedure, and methods of assuring objective measures of the results. Controls could then be instituted at various points where variables might possibly occur. In the case of the different constituent

* The studies were conducted under the auspices of the Commission on Influenza, Army Epidemiological Board, Office of the Surgeon General, United States Army.

studies, therefore, the investigators could retain an independent perspective while conforming to a plan which would provide for uniformity in the essential procedures.

The Plan of Study

The plan of investigation developed for the 1943 studies in the evaluation of vaccination against influenza by the Commission on Influenza attempted then to provide for:

1. A supply of adequate vaccine.
2. Selection of a homogeneous, stable population.
3. Uniform procedure.
4. Close observation by highly competent investigators.
5. Confirmation of diagnosis.
6. Controls, controls, and controls.

The ASTP units of the Army offered a homogeneous *population,* housed usually in university dormitories, under constant observation, with similar patterns of activity, and all were under the same form of medical supervision. The units were not at that time likely to be dispersed by changes in the training program and could therefore be available for continued observation. Through the Service of Preventive Medicine, S. G. O., authority was obtained to carry out a controlled investigation in complete units, and if there were limitations on the participation of a unit as a whole, it was excluded from the study proper.

In order to attain a study of reasonable size, it was necessary to include multiple ASTP units. They were selected, therefore, on a geographic basis from the Atlantic to the Pacific Coast, corresponding closely with the location of Commission members, thus providing for close supervision and observation, and facilities for laboratory investigations by the interested, highly trained groups. Geographic dispersion also increased the chances that an epidemic prevalence would be encountered. In addition, the several studies furnished controls upon each other, and the results would be, perhaps, of greater value than a single observation involving larger numbers. Six integrated studies were therefore arranged in nine universities.

The *vaccine* proposed for use had, by exposure of vaccinated and unvaccinated subjects to induced infection, been shown to elicit resistance to influenza A and B. Serological tests had also demonstrated that its administration resulted in a sharp antibody response to the two types of virus which remained at a high level for 4 months at least. There was, therefore, preliminary evidence to suggest that an effect under normal epidemic conditions might be demonstrable. The same vaccine was used throughout. Because two different lots of material were involved, they were to be mixed equally before use. A preparation of physiologic salt solution containing the same amounts of formalin and mercurial preservative was also provided. The effort was made to carry out the procedure in all groups within a short period in late October or early November on the guess that a widespread epidemic would not appear before that time. It was intended to revaccinate the same persons about January 15 if influenza had not occurred, so that a subsequent epidemic would not be more than 2–3 months removed from the time of vaccination. Each company or organization within a unit was divided so that alternate individuals received 1.0 c.c. of vaccine or control material subcutaneously. In this manner each unit furnished its own controls, obviating the need to rely on the comparison of one unit with another.

One form of card was used throughout for personal identification and record of vaccination. White cards were used for those receiving virus vaccine; blue ones for the controls. But the men knew only that two different vaccines were being administered. The frequency of

reactions to vaccine was determined by direct visit to the entire group 24 hours later, by the appearance of men at sick call, or by questioning the entire group at the end of a week. After the vaccination program was completed in each unit, the vaccination file was stored so as not to be available until analyses were begun. There was then a stable, fully inoculated population of approximately 12,500 in different institutions under the observation of different objective observers seeking to employ the same procedures and the same standards of evaluation.

In order to maintain the stability of the study, new men coming into the unit, few in number, were not entered, and records of any leaving the unit were kept. There was essentially no transfer from company to company within the unit. The loss was of no significance. For example, at the University of Michigan in the interval between vaccination and the end of the epidemic 19 were lost from the control and 16 from the vaccinated groups, approximately 2 percent of the total. In general, furloughs were issued on an organizational basis. In two instances furloughs of the entire unit took place for 8 and 10 days, respectively, after vaccination and presumably before epidemic prevalence, since questioning of the men upon their return revealed no large number of illnesses during the period of leave. It is difficult to assess the influence of such an occurrence upon the subsequent course of events, but it was the type of interruption which it had been hoped could be avoided.

Clinical Observation

From the time agreement was reached to include a unit in the study, arrangements were made to maintain close observation of illness in the units, and at 2-week intervals the results were communicated to all participating groups. Diagnostic terminology was largely standardized after discussion and written descriptions were accepted by the investigators and their other clinical associates. Although originally five categories were described, the number was in practice reduced to three: influenza, common cold, and local respiratory infection. The diagnosis of influenza was considered to be associated with rapid onset, chills or chilliness, aches, prostration, and fever with ordinarily few prominent catarrhal or respiratory signs or symptoms and without obvious evidence of other disease. The common cold was used to designate essentially coryza with little or no fever or constitutional symptoms or febrile complications. Local respiratory infection comprised pneumonia, acute streptococcal pharyngitis, and tonsillitis, infectious mononucleosis, acute sinusitis, otitis, etc.

The medical care of the ASTP units was usually the responsibility of the student health service of the university and this fact of itself promoted reporting. The students were, moreover, seen by the same staff at sick call and after admission to the hospital if it occurred. In addition, the members of the research team could participate without limitations related to military duties. There was practically no "on quarters" problem. Regulations required hospitalization of all patients with temperature of at least 100° F. p.o. or more, and in some of the groups a lesser degree of fever was set as the admitting limit. An example of the customary procedure is given in that employed at the University of Michigan: Sick call was held at specified times each morning in the Student Health Service. In addition, individuals who became ill at other times of the day or night either reported or were visited in quarters. Unless admitted to hospital, they were referred to sick call the following day. The great majority of the patients on sick call as well as others reporting illness were seen by one of us in his capacity as contract

surgeon. In addition, all patients who were hospitalized were closely observed and followed by at least one of us. Because of the fact that all individuals with illness of any kind reported to the same dispensary, not only were cases of respiratory disease requiring hospitalization observed, but the milder forms as well. In this respect, the cooperation of the officers and men was extremely good. Consequently, an opportunity was afforded for clinical and laboratory studies upon cases of respiratory disease that ordinarily do not come to the attention of physicians because of the absence of fever and mildness of symptoms. The latter are referred to as the dispensary group, as distinguished from the more typical cases in the hospitalized group.

Records were kept of the daily attendance at sick call, at which time temperatures were taken and brief notations made of the chief symptoms and prominent features of the examination. At the same time the physician's clinical impression was recorded, using the following terminology: influenza; local respiratory infection (nasopharyngitis, tonsillitis, pharyngitis, sinusitis, etc.); common cold (rhinitis); a few cases of pneumonia unrelated to the epidemic; measles, and infectious mononucleosis. The men were requested to return to sick call daily until symptoms improved or temperature fell below 99° F. In this way the duration of illness in the mild cases could be followed.

Except in a few instances, all men who were found to have a temperature of 100° F. or more were hospitalized. It was possible to study the latter group much more carefully. Histories and physical examinations were more detailed; temperatures were recorded every 4 hours; leucocyte counts were obtained at least once in almost all instances; and roentgenograms of the chest were made whenever indicated. The administration of antipyretics, but not of analgesics, was withheld to avoid influencing the temperature response to infection. Sulfonamides were used only in the presence of frank bacterial pneumonia. The patients were visited daily while in the hospital and then followed in the dispensary if necessary.

Records

Two standard record forms were used by each of the groups of investigators. They were: (*a*) a master card containing the identifying data and vaccination record of each subject and (*b*) an illness record form. On the reverse side of the master card provision was made for summarizing the results of the laboratory tests.

Master cards were prepared in advance and the date of injection and material received were entered at the time of inoculation. The master file, containing the record of vaccination, was removed from the place of attendance at sick call (Student Health Service) and was not consulted until the study was completed. Clinical evaluations were made without knowledge as to whether the patient reporting to sick call was in the vaccinated or control group and were usually recorded at the time the patient was examined.

In the case of patients seen only in the dispensary, the forms used for recording the clinical data were completed daily from the "buck-slips." In the case of hospitalized patients, more detailed records of history were obtained and physical examinations were made. This information was supplemented by clinical and laboratory data recorded on the hospital chart.

Specimens for Laboratory Investigation

At the time of vaccination and again 2 weeks later, blood for serological study was obtained from approximately 10 per cent of the vaccinated subjects and 20 per cent of the controls. Every tenth person receiving the influenza vaccine

and every fifth control, based upon alphabetical arrangement, were selected for the sample group. The serological response to vaccination could thus be clearly defined by establishing the fact that the control group did not also exhibit a rise in titer. Moreover, the same individuals were thus available as a reference group who could be bled at the conclusion of the study to determine the comparative frequency of clinical and subclinical infection.

The purpose of the laboratory studies was to demonstrate the nature of an epidemic that might arise and to give further evaluation of the clinical diagnoses. Since it was scarcely practicable to obtain all the desired materials from all subjects, or to process all that might be obtained, efforts were concentrated upon the patients admitted to hospital, hence, the most evident illnesses.

For the detection and identification of influenza virus, throat washings were taken from practically all hospitalized patients during the acute phase of illness. Blood samples were obtained in the acute phase and approximately 2 weeks later in convalescence. A sampling was also to be obtained, if possible, from milder illnesses.

A variety of methods for isolation and identification of virus was available. The three most commonly considered were (1) the inoculation of throat washings into ferrets and the subsequent transfer to eggs or mice; (2) the testing of the serum of the inoculated ferrets for antibodies against known types of influenza virus; (3) the inoculation of eggs and serological identification of virus so recovered. Since the throat washings would be obtained throughout the period of study, the continued presence of the causative agent—or its disappearance—would be demonstrable. But it is not possible in all epidemics to obtain a high percentage of isolations by these methods.

The rise in titer of specific antibodies in convalescents from infection was known to be a rather uniform phenomenon. The titration of antibodies in paired acute and convalescent sera would serve, therefore, as the most effective procedure for diagnostic purposes. It was realized, however, that persons with high antibody titers at the onset did not necessarily show a clear-cut rise, and that this fact might limit the validity of results in vaccinated patients. The desirability of measuring antibodies against more than a single strain was also in mind. But the frequency of positive responses in the controls would certainly furnish a proper basis for estimating the incidence of influenza among them and be thus available for comparison with the observations in the vaccinated group. One could assume the error to be of common extent in the total. These tests also offered a possibility of determining a correlation between antibody level and the occurrence of illness.

Reporting

Except for the limits of fever or the duration of illness as reflected in hospitalization, it seemed undesirable, because of the brief and variable course and the general mildness of disease anticipated, to undertake to grade the severity of illness. Consequently, the major interpretation would rely upon the frequency of hospitalized patients in the two groups. It was realized, of course, that vaccination of half the group could well result in a reduced incidence among the controls which would not necessarily reflect the incidence that might be encountered in a general population not subject to a possible protective influence of the vaccine. The duration of the study was intended to be that of the epidemic period or at least until April 15 in case of a second epidemic of another type or a resurgence. All analyses were to be made by the different groups of investigators in-

dependently and essentially ignorant of the results observed elsewhere.

In concluding this description of the organization of the 1943 study by the Commission on Influenza, it is of interest to point out that a plan earlier established by the Commission for early identification and notification of influenza by its members on a country-wide basis gave prompt information of the earliest known upsurge of the disease in that year and alerted all investigators to the beginning of the epidemic. The arrangement begun at that time has been expanded in subsequent years to a World Health Organization program.

The minor variations from the adopted plan were limited in number and were essentially related to circumstances surrounding a particular unit. The comparative uniformity was also reflected in the results; in the unit in which the greatest number of deviations from the program took place, the results differed most markedly from the rest. The similarity in effects elsewhere added significance to the total. Fortunately, or otherwise, since the epidemic came promptly upon the heels of the vaccination and terminated before Christmas furloughs, little opportunity for disruption occurred. The tightly controlled program arranged under conditions of similarity of the study groups and the highly competent workers using uniform procedures and independent analyses yielded significant results which have stood the test of repeated analyses and critical examinations.

Later Studies

It seems to me important to point out that the planning and experience during this 1943 Operation Flu contributed as well to the later studies for the evaluation of vaccination against influenza. It has been possible also for the same experienced investigators to continue studies in subsequent years. In 1945, vaccine was used uniformly throughout the Army and it was, therefore, impossible to conduct a similar study. But because of the essential identity and management of the populations involved, and the opportunity for the same type of observation by the same investigators both in the clinic and in the laboratory, it was possible to study the incidence of disease in unvaccinated Naval units and vaccinated Army units on two campuses.

In 1947, a more difficult situation was encountered. A study of the incidence of influenza in the student body at the University of Michigan was undertaken on a purely voluntary basis. Housing was quite variable and the assurance of reporting to the Student Health Service was less. A punched-card system was set up to include all students and a record of their vaccination. In all, 10,328 students were vaccinated and 7,615 were not. Daily records were made of all visits to the Student Health Service for respiratory disease and similar lists were obtained from the dormitories. The study was continued from October to May with sampling of the admitted cases through this period. During an epidemic in the month of March the studies were intensified, and 80 percent of the hospitalized patients were shown to have influenza. Subsequent analysis of the distribution of disease according to the history of vaccination revealed no differences. Because of the character of the observations, the negative results at this time add to the significance of the data from the earlier studies.

The studies currently being carried out in the Army by Dr. Salk at Fort Dix and by Doctors Meiklejohn and Lennette at Fort Ord have again received the warm support of Army authorities at all levels. The Commission studies utilize the available personnel at the Army posts and furnish additional medical or technical personnel if necessary. Since they are work-

ing with a population ordinarily observable for only 10–13 weeks, the procedure is to carry out the vaccination of units as they are formed from October to May. At present four different vaccines are employed and distributed evenly among the developing units. In this manner there are at least two control groups for each vaccine. The same pattern of close observation of respiratory admissions, of adequate records, and of continued intensive viral and serological studies is followed. By virtue of the continuous vaccination program, there is on the post at all times a sufficient number of persons who have received the vaccines to furnish a measure of differences in effect if an epidemic occurs. The two studies are strictly comparable with the same record cards, the same vaccines and the same procedures employed. If the vaccine induces a reasonable degree of immunity, it should be discernible under these conditions. If a difference between the specifically vaccinated and the controls is not discernible in the presence of an identified epidemic of influenza by strains similar to those of the vaccine, the value of the vaccine cannot be too great. On the other hand, too much cannot be said of the need for interested, trained, and careful investigators to undertake and prosecute such a continued investigation.

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Evaluation of Diagnostic Signs and Therapeutic Tests for Nutritional Deficiency States

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RECENT advances in the science of nutrition have added immeasurably to our knowledge of the factors involved in deviations from the condition termed good nutritional status. Of special importance to the discussion today are three developments. First, there is the constant discovery of new nutrients essential to maintain the human body in a normal state, structurally and functionally, so that today there are over 50 known nutrients with potentially an equal number of nutritional deficiency conditions. Second, recognition of the importance of conditioning factors in the production of nutritional deficiencies has emphasized that a deficient intake of an essential nutrient is only one of a number of factors that may lead to inadequate nourishment of bodily tissues. Third, the concept of chronic and acute deficiency states has modified the diagnostic and therapeutic approach to nutritional deficiencies. These developments have clarified and added materially to our understanding of the nutritional process and have laid the groundwork for new approaches to the problem of malnutrition. But they also emphasize the complexity of the problem of isolating signs of single, specific deficiencies, especially since a nutrient is utilized in combination with other nutrients after transformation to one or more end products, since the function and mechanism of specific nutrients in the nutritional process are not completely understood, and since multiple rather than single deficiencies are the rule.

As background for a discussion on evaluation of diagnostic methods, it will be helpful to comment briefly on several points relating to current thinking about nutritional status and signs of deficiency states. It should be emphasized that appraisal of the nutritive state of a person is the diagnostic objective and that this appraisal is based on an evaluation of the integrity of bodily tissue, not an evaluation of dietary adequacy. It is the end result of the total nutritional process in which we are interested. Any deviations from normality in structure or functional performance having a nutritional basis are evidence of a nutritional deficiency, whether they are the result of deficient intake or of interference or disturbance in the nutritional process. Thus, identification of these deviations and of the nutrient involved is the basic problem in diagnosis. Although each essential nutrient plays a specific role in maintaining integrity of one or more tissues, little is known about the effects of a deficiency of some of the nutrients, and diagnosis is very difficult, if not impossible. From a practical point of view, in most surveys or studies of malnutrition, we are limited to a few specific deficiency states, and an estimate of the total prevalence of nutritional deficiencies cannot be made. On the other hand, those nutritional diseases about which most is known are

probably the ones of greatest prevalence. They have been studied most because they have occurred in some regions and at some times in epidemics, and usually have been known to be nutritional diseases for a relatively long time.

Criteria for diagnosis on which there is complete agreement are still limited with very few exceptions to the severe, acute nutritional diseases. Although it is agreed that these diseases are preceded by milder lesions which very often do not progress to the classic deficiency syndrome, opinion differs as to the milder lesions that are diagnostic for particular deficiencies. The sites of the severe lesions have been studied intensively to establish the nature of tissue changes characteristic of early, acute, and chronic deficiency states. This objective has been accomplished with varying degrees of success. In the case of rickets, studies of X-rays of the bones produced definitive criteria for diagnosis at a very early stage. Several factors contributed greatly to the successful study of this deficiency disease, namely, the subjects were infants whose diet could be controlled, the environmental factors were limited and controllable, and in addition the X-ray provided objective, serial records of bone changes. Except when X-ray is used, observations of tissue changes in humans are confined for the most part to superficial areas, particularly the skin, eyes, tongue, gums, and lips. Specific changes in one or more of these areas which are characteristic of a moderate or mild deficiency of ascorbic acid, vitamin A, riboflavin, and niacin have been described and have been corroborated by animal studies.

In 1942, Kruse elaborated the concept of chronic and acute deficiencies and described specific signs of different stages of the chronic and acute process in the eye for vitamin-A deficiency, in the tongue for niacin deficiency, and in the gums for ascorbic-acid deficiency. Skin lesions and corneal vascularization have been described for riboflavin deficiency and certain skin lesions also are considered characteristic of vitamin-A deficiency. Thus, for four important and probably very prevalent deficiencies, definite characteristic lesions have been described in areas readily accessible for clinical examination. The extent of agreement and disagreement among the nutrition specialists differs with respect to these various signs but, in general, there is agreement that nutritional deficiencies do cause these lesions, and the disagreement arises over the question whether a particular tissue condition is pathognomonic for a specific deficiency and whether the same lesions are caused also by other, nonnutritional factors.

Techniques are available for diagnosis of deficiency states other than those caused by nutritional failure in ascorbic acid, riboflavin, niacin, and vitamin A. Diagnosis of other deficiencies, however, is based chiefly on clinical evaluation of various symptoms, functional tests, or laboratory procedures or combinations of them, and may require also therapeutic tests. The following discussion is directed to the problem of evaluating the physical signs proposed for clinical diagnosis of specific nutrient deficiencies.

Evaluation of the criteria for diagnosis of specific nutritional deficiencies has two phases. First, the accuracy with which the diagnostic signs can be described, can be observed, and can be interpreted should be determined. Second, if the signs can be accurately interpreted or classified, is the result a valid diagnosis of a specific nutrient deficiency?

Accuracy of Diagnostic Signs

Diagnosis, as has already been suggested above, depends on observation of the condition of any given tissue and on the interpretation of the signs of

abnormality or pathology of the tissue.

It is axiomatic that the more objective an observation is, the better it is. Clinical photography, in color if needed, affords a satisfactory method of obtaining an objective, permanent record of the condition of selected tissues, such as the gums, tongue, conjunctiva, skin areas, etc. Its value and advantages in diagnosis and classification of the condition of a superficial tissue can be compared with that of the X-ray in a study of tuberculosis or rickets. In the present stage of development of specific criteria for diagnostic signs, and of lack of uniformity among physicians in classification of acute and chronic processes and their stages, the complete detail made available by a photograph is indispensable. No amount of description of the condition of a tissue by the examiner can provide as adequate a basis for a diagnosis and for evaluation of change in the condition on therapy as do photographs.

Few physicians have had sufficient training and experience in making observations on deviations in tissues used for nutritional diagnosis to be able to establish at the beginning of a study definite criteria for a normal tissue and for classification of types and degrees of change that may be encountered. If pictures are available, experience with all aspects of the pathology of a given tissue can be acquired. The criteria for classification may be established to bring out the differences in individuals that are actually found. All pictures then can be reviewed and classified.

An appraisal of the reliability of a physician's classifications can be made by repeating the classifications for a number of pictures and comparing the results. Such a repetition periodically when a study continues over a considerable time will pick up any shift in the interpretation of the signs that may have occurred.

Comparability of diagnostic classifications by different physicians also can be tested by comparing their results for the same pictures interpreted independently. Differences brought to light may result in improving the precision of the criteria and diagnostic standards.

From experience with studies with photographs and without photographs, I am convinced that no investigation of the signs of nutritional deficiencies and no appraisal of therapeutic studies should be attempted without clinical photographs if the tissues under observation can be photographed.

In the situations in which a photograph is not feasible, observations recorded should be an objective, detailed description of the histopathology of the tissue examined. Types and gradations of pathological variations in the tissue must be clearly defined. Tests of the examiner's ability to observe and record the condition of the tissue accurately should be made.

Therapeutic Tests of Deficiency Signs

Evidence that a specific condition or lesion is caused by a deficiency in a specific nutrient is obtained usually by a therapeutic test. That is, does the administration of the nutrient, orally or by any other route, restore the tissue to a normal condition? Some conditions produced by a past deficiency or by a chronic deficiency lasting for a long time may not be reversible. One can cite skeletal deformities due to childhood rickets. The possibility that such permanent changes occur does not alter the fact that therapeutic reversal of signs is the most definite source of evidence in human experiments of a causal relationship between a deficiency of a specific nutrient and a particular lesion.

Adequately controlled therapeutic studies on humans present a number of difficulties. It is not possible to apply to humans the techniques used in animal experiments in which control and experimental animals are matched as to age,

sex, genetic, and environmental factors, and food intake is controlled both during previous and experimental periods. In human studies, such homogeneity in the groups of control and treated subjects is not possible. Substitute methods for obtaining comparability of experimental and control groups must be found. Comparability cannot be complete and absolute, but the two groups should be matched or balanced so that their composition is equally weighted by subjects in various categories related to factors that may influence results of the therapeutic test. The factors to be considered in matching the groups may be discussed under three general headings: first, the initial deficiency status; second, nondietary conditioning factors contributing to production of the deficiency; and third, dietary history and habits.

1. *Deficiency status.*—On the basis of the pathology of the tissue under observation and evaluation, the deficiency condition of the tissue should be classified as acute or chronic, or both; and for both the acute and chronic process a rating should be made of severity and stage of development. For some tissues and signs, criteria for differentiating acute and chronic may not be available, but gradations in the extent and severity of a particular type of pathology should be established. These are problems for the clinician. Some grouping of details of pathological deviations may be necessary to avoid too many classifications. The several classifications should be well defined. Accurate classification of the initial condition of the tissue is most important. The degree of deficiency of the tissue is the major influence on the rate of response to therapy.

2. *Nondietary conditioning factors.*—The term "conditioning factors" is used very broadly to include anything that may affect the balance between supply of a nutrient to the tissue and requirement for the nutrient at a given time. The number of conditioning factors is very large and they cannot be discussed here. They include metabolic dysfunctions, infection, gastrointestinal disturbances, etc., as well as such normal processes as growth, pregnancy, and excessive physical activity.

Some control of conditioning factors in a therapeutic study can be accomplished in two ways. First, all persons selected as possible subjects for the study should have an examination to screen out those with complicating conditions, such as diabetes, thyroid and other glandular abnormalities, serious chronic infections, gastric ulcers, asthma, and allergies. Persons with definite complicating conditions such as these should be studied separately as their therapeutic response may not be equal to that of other individuals. Second, subjects should be grouped by individual characteristics and by indices of external factors having possible effects on intake, need for, or utilization of nutrients.

Grouping by sex and age affords some control of variations in metabolic rate and hormonal activity, and, in the case of children, of the factor of growth. For therapeutic studies on children in or approaching the adolescent period, classification by an index of developmental age will be necessary unless the numbers of persons in the control and therapy groups are so large that equal variation in the two groups can safely be left to chance. Grouping of adults by occupation or some index of physical activity may be necessary to control the factor of energy expenditure. Also, special conditions such as exposure to heat or cold or toxic chemicals may need to be controlled.

3. *Dietary factors.*—The third factor for which comparability of therapy and control subjects should be controlled to some degree is dietary history and habits. For this purpose, it is sufficient to obtain enough information to identify those eating a definitely poor diet or hav-

ing unusual food habits and to determine whether the current diet is typical for a long period or is affected by recent changes in eating habits. Subjects should be classified as to whether diet is probably the major or primary factor in causing the deficiency condition noted or whether other factors have played an important role.

Although the therapeutic dosage or supplement given in a therapeutic study will supply an excess of the nutrient being tested, the diets of the subjects may affect the results. For example, persons with a history of a low intake of a nutrient may have extensive pathology of tissues other than the superficial ones observed, and the response to therapy may be slow because of the need for extensive tissue restoration. Also, persons in the control group whose diet is not the primary cause of tissue deficiency may show definite improvement if the other conditions change; and diets of persons in both the control and therapy groups may improve with benefit to tissue condition. Interpretation of results can be greatly aided by knowledge of dietary habits.

When the diagnosis classification has been made for all subjects selected for the therapeutic study, and those in each diagnosis class have been placed in various subgroups for sex, age, and other indices of conditioning factors and for quality of diet, persons in each subgroup are allocated either to the control or therapy group. Allocation should be on a random basis. However, if the classifications have been made to take into account the known factors of possible influence on the results, there is little opportunity for a selective bias in forming the control and therapy groups.

It has been shown that pathological tissue is restored to normal very slowly and that long-time therapeutic studies are required to test the effectiveness of a given nutrient. The more chronic and advanced the lesion is, the longer will be the time required. There is much evidence that deficiency lesions of a chronic nature are the types most commonly found in this country and that reconstitution of the tissues involved becomes apparent only after treatment for several years. Therapeutic studies lasting a few months to one year have yielded conflicting results. In many such studies, either no positive results or doubtful results were obtained unless the deficiency signs being evaluated were acute or subacute manifestations.

The evaluation and interpretation of the effects of therapy over a period of 3 or 4 years or longer require repeated observations on the populations of both the control and therapy groups. Reexamination may be at intervals of 6 months to a year. At these times, data on factors discussed, i.e., nondietary conditions and diets, should be obtained to appraise their influence and the continued comparability of the groups.

Long-time therapeutic investigations in which the diagnostic criteria are objective, clearly defined, and held constant, and in which comparability of control and experimental subjects is established initially and evaluated periodically are a fundamental need to improve the techniques for evaluation of nutritional status. With accurate and valid diagnostic techniques for major deficiencies available, public health programs in nutrition can be put on a sounder basis. Also, these techniques will make possible an improved scientific approach to the problem of the relation of deficiency states to health and disease.

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Discussion

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A SOUND approach to the evaluation of a technique for diagnosis or therapy begins, as does a geometry, with a set of basic definitions: Exactly what is the technique, how is it tested, by what criteria is it to be evaluated? We need to avoid the trap set by the White King for Alice in evaluating a therapeutic technique for faintness.

"There's nothing like hay when you're faint," said the King.

"I should think," said Alice, "throwing cold water over you would be better, or some sal volatile."

"I didn't say there was nothing *better*," the King replied. "I said there was nothing *like* it."

The confusion here is clearly one of failure to define the criteria. The three excellent papers which have been presented this afternoon are devoted primarily to careful statements of the definitions and of the criteria involved in each particular problem of evaluation.

In studies of diagnosis, therapy, and prophylaxis, we are dealing with three separate but interlinked problems in calibration of techniques. I am going to confine my discussion to the situation where we have under consideration a specified disease or condition which can be recognized, at least in its severe forms, by clinical or other means. That is, we have a definition of the condition that we are trying to diagnose, treat, or prevent. The concept is that every individual occupies some position on a graded scale with regard to this condition, ranging from the position of complete freedom from it, through incipient and minimal phases, to stages of greater and greater severity. Thus we conceive of gradations of nutritional deficiency, hearing loss, and presence of influenza. Different diagnostic techniques will vary as to their ability to grade people accurately relative to the condition. The ideal technique would, at low cost, be *sensitive*, that is, designate and grade accurately the diseased persons, and it would be *specific*, that is, correctly specify the persons free of the condition. The evaluation of the technique involves determining how well it performs this function.

An evaluation of the diagnostic tool is an essential preliminary to the evaluation of a therapeutic technique, for it is through the diagnostic technique that we select the persons for treatment and judge the success of the treatment in restoring them to normal. An excellent therapy for nutritional deficiency or hearing loss might appear faulty if the persons on whom it was tested were not in fact suffering from the supposed defect. Similarly in prophylaxis, the evaluation of an influenza vaccine requires the ability to diagnose influenza when it occurs. Thus the diagnosis problem is the most fundamental of the three. It also presents the greatest difficulties of evaluation.

We are considering methods for evaluating these techniques in surveys or field experiments, rather than in the laboratory or the clinic. Such field studies are the final and crucial step in evaluation after laboratory and clinic studies have already been completed. Any technique proposed for diagnosis is usually subjected to a very thorough laboratory study to determine its precision, the ability of observers to use it, its success in separating control and diseased animals, its side effects, its

cost, and so on. If it appears promising in the laboratory, it may next be tried on patients. Patients appearing for treatment will include some advanced cases that can be recognized clinically or by whatever tests have led to the designation of this condition as an entity. Thus we will have frank cases of nutritional deficiency, or deafness. Our proposed technique tested on the clinic population will have an opportunity to differentiate between the recognized cases and others in the clinic. This test on patients serves as a mechanism for eliminating from further test those techniques which show no promise. Substantial laboratory and clinical work is an essential prerequisite for successful field studies.

However, the final evaluation cannot be on patients but must be on the population. We have visualized the population as being distributed with regard to the condition, some being completely free of it, some at various minimal stages and some more advanced. A self-selected group of patients presenting themselves for observation, diagnosis, or treatment will not be representative of the general population. It may in fact give us almost no normal persons. We can get no real calibration of the technique on a distorted distribution of this sort.

In testing the general population with the technique, we face, however a very real dilemma due to the fact that we do not know their true condition. We would expect at one end of the scale a substantial number of normals and at the other end of the scale we would have some frank clinical cases to correlate with our technique. But what about the intermediate range where the condition may be present, but incipient or inapparent? We often feel our greatest need of a diagnostic tool for such cases because they represent our greatest hope for prevention or cure. We require some method for determining whether the technique is correctly designating people in this area.

One approach to this objective is through correlation of this test with some other variable. For example a technique for measuring the integrity of some tissue might be tested on individuals who are also measured on some independent nutritional scale and the association might be a guide to the value of the tissue test. It should be noticed that such associations can be interpreted only if they are established on a general population. In a self-selected group such as appears at a clinic there may be an apparent association which is an artifact due solely to the patient selection. For example, if the clientele of a medical center is such that essentially poor people turn to it for superficial skin lesions whereas people of all walks of life turn to it for more serious defects, this fact alone will produce a correlation between diet and skin lesions among the patrons of the clinic which may be completely lacking in general.

Although correlations between two tests may be helpful and suggestive, the real evaluation of the diagnostic technique comes only through a follow-up of the persons tested. As Miss Wiehl emphasized, in order to get any real assessment of the diagnostic significance of the technique, it is necessary to have *serial* observations to see the extent to which the people progress from one stage of the disease to another. If there is neither stability nor progression in the successive tests or if there is no difference in progression rate between those called normal and those considered not normal, the value of the test is dubious.

It is important to recognize that, for this reason, the normals as well as those screened out, must be followed. The proposals in some of our currently popular screening clinics to follow only the group screened off as of diagnostic significance would defeat

any examination of the validity of the screening process.

The evaluation of any diagnostic test will show it to be an imperfect instrument. It may overdiagnose, thus exaggerating the true severity, and designating some of the true negatives as positive. Or it may underestimate the number and severity of positives. It may be satisfactory in the minimal cases and fail on the far-advanced cases, as does the tuberculin test. Its imperfections must be judged as to their importance in the particular problem under study. In nutrition problems little harm may be done if supplemental feeding is prescribed unnecessarily in some cases. But the erroneous designation of a person as syphilitic, cancerous, or tuberculous may be far more serious than missing a diagnosis in a true positive. Such issues must be considered in setting up the criteria of evaluation in each problem individually.

Leaving now the diagnostic problem and turning to therapy and prophylaxis, we face an easier problem in interpretation because we do not have an unknown true value to contend with. Our difficulties are more apt to lie in achieving a well-controlled study. In therapy the problem is to evaluate the ability of the treatment to restore to normal persons judged to have the condition, or at least to prevent progression to more serious stages. This evaluation requires, ideally, selecting the impaired persons in the general population, dividing them into two groups in every way similar in character, giving one the prescribed treatment, and the other a treatment similar in every respect except for the presence of the therapeutic agent to be tested. The two groups are then followed to observe progression or cure rates. It will be recognized that practical difficulties frequently prevent achieving the ideal control and therefore the real evaluation of the therapy may be obscured. The enormous benefits in getting a real evaluation are so great that a well-controlled study should always be the goal and practical difficulties should not be easily accepted as insurmountable.

Our prophylactic studies are similar in character except that the normal persons are the subjects. Again they are divided into two similar groups, a treated and a control group, and followed to observe incidence of the disease.

In all three of the evaluation problems many issues arise in carrying out sound planning and execution of the studies. A number of them have been illustrated and discussed in the studies presented this afternoon, and I will outline them briefly by way of emphasis and summary.

First, the actual observations to be made at initial and follow-up examinations should be as free from subjective judgment as possible. As Albritton puts it, "The patient trusts the doctor and the doctor trusts his hypothesis and both may overestimate his improvement." The use of photographs rather than word descriptions was advocated by Miss Wiehl to achieve such objectivity in nutrition studies. It is for this purpose also that the identity of the treatment group was concealed from the subject and observer in the deafness and influenza studies. The long arm of psychological factors may stretch even to the writing down of the record and it is favorable if the experimenter can be unburdened by knowledge likely to prejudice his findings.

As a further aid to objectivity, the record forms should be completely prescribed. They should of course be carefully planned to be clear, convenient, and complete, and should be thoroughly pretested before final acceptance.

Written instructions on all parts of the study should be prepared which include definitions of terms, rules of recording, and frequency of observation. This step assures that the definitions and

instructions are clear-cut and are understood by all participants, and it also provides the necessary information for an interpretation by nonparticipants. It is not necessary that these people approve the definitions but they must understand them. Since in a follow-up study, the persons initiating the study often do not complete it, their successors need a written document in order to carry it forward.

Such efforts to secure good observations will be in vain unless they are supported by training and supervision of the personnel responsible for the observing, and the establishment of good public relations with those observed. This is particularly critical, as Dr. Hardy and Dr. Bordley pointed out, in long-time continuing studies which must avoid exhausting the good-will of all concerned.

Finally, the advance work should include the tabulation forms and plans for analysis. This step may seem premature, but it will turn a bright light on flaws of omission of an essential piece of information or of inclusion of excessive data.

This plan for analysis should not only outline *how* it is to be done, but *when*. Field studies are apt to be large. They frequently involve many people and massive files of records. They can easily evolve into a system for collection, such that the time never seems ripe for taking stock of the findings and answering the question. Part of the advance planning should be the setting of a terminal date.

Much has been written about the boldness required to make the first move in any enterprise. Churchill speaks of the audacity needed to put the first daub of paint on a fresh canvas, and Benchley of the wisdom for the first move in erecting a skyscraper. Perhaps even more audacity and judgment are needed to make the last move. Setting the time for it in advance has been thoroughly evaluated as a sound prophylactic technique.

Discussion

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EVERY survey, study, or experiment begins with a question. What does the investigator primarily want to demonstrate? It is important to state the question explicitly at the beginning of the study. We are all familiar with the paper which starts out in describing how things were done, methods that were used, problems that were met, and when we get to the end we are still left with the wonder as to what the writer was trying to prove. It is particularly important to keep in mind the basic question, especially in studies which cover a relatively long period of time. Continual contact with unforeseen problems and details and with numerical data that are being gathered tends to stimulate questions which the study was never designed to answer.

I should like to point out in connection with multiple screening programs that these broad, over-all surveys may be suffering from just this very matter. The basic question here is: As a case-finding technique, what is the proportion of diseased individuals picked up but not already known to the physicians? A corollary would be: Is this proportion sufficiently large to make an extension of the program worthwhile? Yet as a result of the temptation to make these programs too comprehensive, in the sense of answering too many questions, the basic purpose is dangerously close to being forgotten.

In connection with an explicit statement of the question to be answered by the survey, there is closely allied the determination of sample size. For this purpose it is necessary to predetermine the minimum difference between what will have been observed and what is to be expected on the basis of some hypothesis that the investigator desires to detect as significant. In this regard I should like to introduce the concept of a meaningful difference. For example, analysis of the data might show that the difference between 7 percent observed and 5 percent expected is significant. But then the question is, How important is such a difference? Is it meaningful? It would not be remiss, perhaps, if every project, when still in the early planning stage, would not only set out the question to be answered but also the minimum difference for which it is meaningful to determine significance. In this regard let us refer to each of the papers. In one, the question concerns the efficacy of nasopharyngeal irradiation in preventing deafness in children with lymphoid tissue. What is to be considered as efficacious? If the difference between the treated group and the controlled group is 2 percent, will that be of sufficient importance to consider the treatment worthwhile, or must there be a difference of at least 5 percent or some other percent? And if it is 5 percent, is the sample size large enough to detect this difference as significant? Similarly, in the paper on the influenza vaccine, an observable difference is being sought in the incidence of influenza among vaccinated individuals and nonvaccinated individuals. Here again what does the investigator consider the minimum difference important enough to detect in order to make vaccination a mass project? In the case of the paper on diagnostic signs for nutritional deficiency states, the problem is slightly different

and I shall return to it subsequently.

In line with the previous comments, I should like to point out what is ordinarily done statistically when sample size is being determined. Let us assume that, in order to demonstrate the effectiveness of a treatment, the results in a treated group should be at least 5 percentage points lower than the known incidence in the population, which, say, is 20 percent. Then the sample size is usually found from the equation $t = .05\sqrt{n} / \sqrt{.2 \times .8}$. To solve for n, it is necessary to determine a probability level, say 5 percent and, for this case, since a one-sided test is required, the corresponding normal deviate is 1.645. The sample size required is approximately 175. Then, as you are all aware, the statistical test will reject the hypothesis of no difference 5 percent of the time, even when the hypothesis is true. But what is not too clearly understood is that this procedure will accept the null hypothesis as true when, in fact, it is false, 50 percent of the time. This would mean that the chances are one in two that the preceding test may not find the minimum difference to be significant when, in fact, it is. I should like very briefly to run through a more appropriate procedure where the latter-type error is more carefully controlled.

The argument is most simply presented graphically (fig. 9). The null hypothesis is represented by H_o and states that the true value of the percentage, P, in a hypothetical treated population is .20, i.e., $H_o(P = .2)$. To demonstrate that the treatment is effective, it is necessary to reject H_o as false. But then some other hypothesis must be true, e.g., $P = .19$ or $P = .18$, etc., and is represented by H_1. In this illustration, we have decided it is meaningful to reject H_o in favor of H_1 only if there is a difference of at least 5 percent, so that H_1 is $P = .15$. Then it is known how the difference, $p - P$, where p is a sample proportion based on samples of size n, is distributed under each hypothesis. The respective distributions are shown in fig. 9. Since the test is always made on H_o, whatever H_1 is,

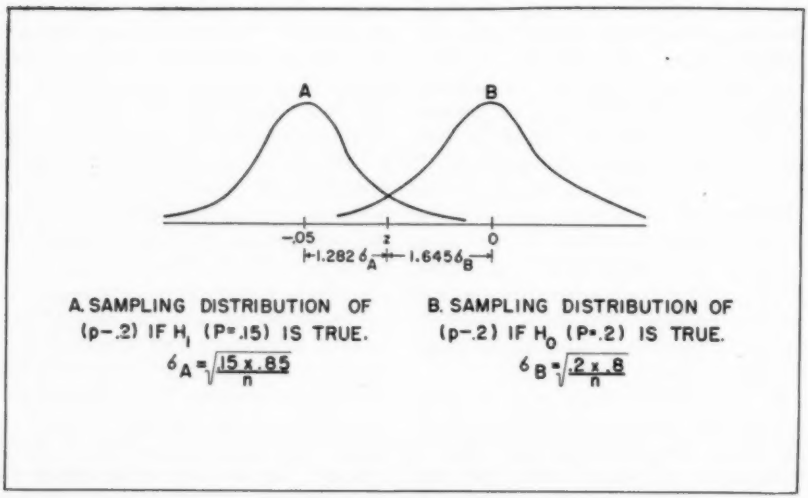

FIGURE 9—Distributions of Sample Differences, p-.2, Under Two Different Hypotheses

$p - P$ becomes $p - .2$. If H_0 is true, this difference is distributed normally with mean, 0, and standard error, σ_B (see B above); if H_1 is true, $p - .2$ is distributed normally with mean, $-.05$, and standard error, σ_A (see A above). Now set the probability of making the first kind of error, rejecting H_0 when it is true, at .05, and the probability of the second kind of error, accepting H_0 when H_1 is true, at, say, .10. Since H_0 is to be rejected 5 per cent of the time when true, there is required a point z in distribution B such that 95 per cent of the differences, $p - .2$, are greater than z. This point falls at a distance 1.645 σ_B to the left of the mean of zero in B. But if H_1 is true, there will be some differences which are part of distribution A and also greater than z. Such differences will result in incorrectly accepting H_0, and if it is desired to confine the proportion of such wrong decisions to .10, z must be at a distance of 1.282 σ_A to the right of the mean of $-.05$ in distribution A. Therefore the condition to be met if it is desired to reject H_0 only 5 per cent of the time when it is true and accept H_0 only 10 per cent of the time when H_1 is true is given by

$$1.282\,\sigma_A + 1.645\,\sigma_B = .05$$

and

$$n = (1.282\sqrt{.15 \times .85} + 1.645\sqrt{.2 \times .8})^2 / (.05)^2$$

Now n turns out to be approximately 500.

There are very few remarks that I have to make on the specific procedures used in any of the three papers. In fact, what I will say will be more in the line of questions rather than criticisms.

In the paper on nasopharyngeal irradiation, it will be noted that children were originally screened by the audiometer for losses of hearing of either 15 decibels in two tones or for 20 decibels in one tone in either ear and then these children are further screened for the presence of lymphoid tissue. This means that the study group consists of children having lymphoid tissue where hearing is already impaired. Thus any conclusions concerning the preventive or curative effects will have to be confined to children whose hearing is already impaired. Now this seems to be an unnecessary restriction. It would appear to be of additional interest to know what the effect of treatment would be in children who have lymphoid tissue present but whose hearing is as yet normal. Thus I would question why the original screening was not carried out with respect to lymphoid tissue. Was it because of practicality?

In the paper by Dr. Francis I have a question touching on certain problems in connection with large field studies involving epidemics. Here we have a situation where a large organization is required to fulfill initial conditions of the survey and then everyone has to wait around for the epidemic to strike. If there is no epidemic, or if, as is most probable, the epidemic is mild, all these preparations may be wasted. Secondly, as Dr. Francis so aptly points out, there is always present the question as to the extent to which the mere fact of vaccination interferes with the course of disease and affects the respective probabilities that those in the control groups and those in the vaccinated groups will become infected. The question I raise here is this: in order to answer specifically whether vaccination has any affect in immunizing individuals against influenza, would not the smaller, voluntary type of experiment be more efficient and more powerful? Especially in this case where the virus has been isolated and an assay could be run to determine the ED50. Thus it could be determined whether there is a biological effect in humans, and further still, various observations could be made on the relationship between vaccination effect and varying dosages of virus and whether an immunity obtained through vaccination is of the same nature as the im-

munity obtained in those getting the disease naturally. I am sure studies such as these must have been thought about, and possibly performed, and I wonder if Dr. Francis would comment on the relationship between them and the large field study.

Since the paper by Miss Wiehl is primarily concerned with diagnostic signs and their evaluation and since this constitutes an important aspect in the Hardy-Bordley study, I should like to discuss this problem in a general way. In describing a diagnostic technique, it is essential to introduce two concepts: sensitivity and specificity. The former is the ability of a diagnostic technique to detect a diseased individual as positive; the latter is the ability of the same technique to call a normal individual, or an individual with other diseases, a negative. I shall subsequently return to the importance of obtaining these two values.

First, I should like to distinguish between two types of situations. One is where the diagnostic procedure can be applied to groups of known diseased and known normals. The other is where the diagnostic procedure is applied to a single group containing diseased and normal individuals, but the diseased individuals are unknown or at most suspect. The latter presents essentially the problem of evaluating the diagnostic value of the very means by which an individual will be classified as positive or negative without having any other means of determining whether he has the disease.

Let us consider first the latter situation. Theoretically it has been handled by Neyman in connection with Yerushalmy's studies in tuberculosis. There were several questions the investigator was attempting to answer, among which were the consistency with which a reader diagnoses the same X-ray plate, and the consistency among different readers. Of importance to us, however, were the major questions in the study, namely, is the X-ray plate a good means of diagnosing tuberculosis, and, among four different types of film, is one a better diagnostic sign than the others. Over a thousand individuals were in the study group and four chest plates were taken on each individual with each type of film. These pictures were then sent in some random fashion to five expert radiologists for independent readings. Thus each individual had a total of 20 readings and it was arbitrarily decided to classify as positive any individual having 11 or more positive readings. Then with the statistical procedure devised by Neyman, it is possible to estimate for each technique the proportions of individuals in the population having the "disease" and free from the "disease" and, most important for the evaluation of diagnostic techniques, the respective probabilities of classifying a "diseased" individual as positive and a "normal" as negative. Obviously, if both probabilities are 1, the diagnostic technique is perfect. For anything smaller it becomes necessary to set up minimum criteria for an acceptable diagnostic technique and a comparison made between the calculated values and the criteria.

It is quite important to point out the limitations of the statistical theory. Since one never actually knows the diseased individual, it is not certain that the obtained probability of detecting a positive is associated with having the disease or with certain properties of the diagnostic sign; the association between the properties of these signs and the disease is still unknown. As Neyman points out, whether it is tuberculosis (or any other disease in this situation) that is being detected cannot be answered on the basis of such a statistical analysis. On the other hand, further evidence on this score could be obtained by taking five or more pictures with the *same* film and having different experts read them.

To make this procedure applicable to Miss Wiehl's study, it is clear at once that all individuals with the same nutritional deficiency must possess the lesion or, at the very least, the proportion not having it should be very small. Otherwise, an estimate of the probability of detecting a diseased individual refers not to all diseased individuals but only to those with lesions. In general, in this situation where the diagnostic means being evaluated are at the same time being used to detect the disease, I feel it may be more profitable, and perhaps the only way of solving the problem, to follow up all positives and all negatives.

Now let us return to the first type of situation. Here we are presented with an evaluation of a diagnostic test or technique on known groups of diseased and normal individuals. In addition, to obtain a measure of specificity, there is included in the study group a set of individuals with various other diseases. Most of the diagnostic procedures devised to detect the disease have been associated with serologic reactions in the form of complement fixation, color reactions, presence or absence of coagulation, and antigen-antibody reactions. The variable produced is usually of a fairly continuous nature, and when applied to the groups to be tested, there usually results fairly distinct distributions for the normal, diseased, and miscellaneous disease groups. Up to this point we do not as yet have a diagnostic test. What we do have is a description of varying reactions to a biochemical technique devised to measure a biochemical process in individuals. If the diseased group shows no overlap with the other two groups, clearly the biochemical procedure devised to detect the internal changes associated with the disease is highly discriminatory and most powerful. Any point taken in the interval between the lowest disease value and the highest of the other values (assuming that the average level of the diseased group is higher than that of other groups) could be taken as the dividing point between positives and negatives. If, on the other hand, there is overlap between the diseased group and other groups, it becomes essential to appraise adequately whatever discriminatory power exists in the basic biochemical procedure. This appraisal results when some value in the overlapping region is selected as a critical point dividing positives from negatives. It is only after a critical value is selected that we have a diagnostic test. That is, the biochemical procedure plus the critical value constitutes the diagnostic test.

For purposes of evaluation two comments are of importance. One is that this concept of the evaluation of a diagnostic test immediately eliminates the possibility of making use of a single measure or index to describe or even rate a diagnostic procedure. Adequate appraisal of the discriminatory power of the biochemical procedure requires two measures: the percentage of true positives detected for a given percentage of true negatives, in other words, the sensitivity and specificity. One of these must be specified prior to the selection of a critical value, otherwise a critical value may result in a diagnostic test which falsely describes the basic procedure. For example, in the ideal instance of no overlap, a critical point could be selected as the most extreme value of the entire study group, so that the diagnostic test would yield 100 per cent true positives and 0 per cent true negatives or 0 per cent true positives and 100 per cent true negatives. Thus sensitivity and specificity should not be dependent upon some arbitrary choice of the critical value but, on the contrary, the critical value should be dependent upon an arbitrary selection of, say, specificity. If, for example, the public health official decides that not more than 5 per cent false positives can be tolerated in a mass screening pro-

gram, a point would be selected for the critical value which yields 5 per cent false positives. The corresponding percentage of true positives would then be determined. The discriminatory power is then given in terms of the percentage of true positives detected for 5 per cent false positives. Of a given number of diagnostic tests, all devised to detect the same disease, that one would be considered best which detects the significantly largest percentage of true positives. If there is only one test to evaluate, the observed sensitivity would then be compared to some predetermined criteria. I should like to point out that the statistical procedure developed for an evaluation of this kind makes it possible to take into account a weighting of the relative importance of a false negative and a false positive.

The second comment pertains to the choice of a critical point by an investigator who attempts to confirm the results obtained previously. It is commonly believed by most research people that in evaluating a diagnostic test proposed by some other investigator, he must adhere to all the details described originally, even to the extent of using the same critical value previously obtained. This is erroneous and may lead to false results. The critical point must be selected from one's own data used in the evaluation and on the basis of a predetermined percentage of false positives (or, of course, false negatives). As such, the critical value is subject to sampling variation. If this variation is so great that upon completion of the evaluation it is almost impossible to indicate to clinicians the use of one point as a critical value, this in itself may be an argument against the diagnostic test.

METHODS IN LONG-TERM STUDIES

Hugo Muench, M.D., Chairman

Certain Technical Aspects of Longitudinal Studies of Child Health and Development

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THE title "Child Health and Development" was originally chosen for this project to indicate its primary purpose, that of obtaining as much information as possible about the interrelationships between health and development. Since this project was started 19 years ago, the term "health" has been interpreted broadly to include mental, emotional, and physical fitness as well as the incidence of illnesses and the presence of handicapping conditions. Attention has been given to these aspects at succeeding ages, as well as to the diet and certain features of the environment, care, and management of the child. Development likewise has been thought of as encompassing all aspects of progress in growth and maturation. Attention has always been given to physical, physiologic, and psychologic factors insofar as opportunity has permitted. The objective which has constantly guided the planning and execution of this project has been to understand as fully as possible the basic attributes of each individual, the characteristics of his progress in growth and development from birth to maturity, and the influence of health and environment at successive stages upon this progress and upon his ultimate development.

It is hoped that better concepts of the health importance of constitutional differences between children will emerge from these studies as well as a clearer understanding of what constitutes satisfactory progress for several essentially different types of children. Better means are sought for recognizing at successive stages what features of growth and development are significant in respect to the ultimate attainment of health and fitness. It is also hoped that light will be thrown upon the different needs of constitutionally different children.

Certain limitations in the possibilities for acquiring the desired information and for drawing conclusions from the data obtained from repeated studies of one sample of children were recognized from the beginning and others became more apparent with experience. To mention a few: (1) When many aspects of health and development are being investigated on the same individual, all cannot be thoroughly studied; (2) the same investigator cannot be counted on to obtain any given information throughout the span of such a study, and any one investigator will change with the years as do his subjects; (3) some aspects of the health, care, and development of children are far more readily investigated than others; (4) some information is obtainable but is highly subjective in

character and is not comparable in reliability with other information to which it must be related; (5) the specific procedures suitable at one age are not always so at another. Because of these circumstances, the contents of histories and examinations have in some respects changed with time and with the age of the subjects. A selection of the best obtainable data for each of many fields has constantly been sought, often through a process of trial and error, so that from time to time, routine observations have been discarded and new ones have been adopted. It is impossible to state without qualification, except in a few instances, that a given procedure has been followed on all children at each age or on individual children at all ages. With the importance constantly in mind of comparability of original observations and measurements and of rating scales applied to them, however, changes in techniques have been avoided and accepted advisedly, and there remain in the records certain items which have been maintained throughout the years.

The attempt to correlate data from different sources and of different degrees of reliability is a difficult one and has received a great deal of attention from this staff. There has been a continual effort to rate all attributes in terms of the individual's position within the range of the entire group of his sex at each age. A five-point scale has generally been adopted for ratings of normal attributes; a "three" indicating the broad middle zone of the range; "one" and "five" indicating extremely low and high values, respectively, and "two" and "four" moderately low and high values. In applying this method of rating to measurement data which permit distributions on a percentile scale, a "one" value is assigned to the lowest 10 percent and a "two" to the next 15 percent, so that "one" and "two" ratings together select the lowest quartile. A "three" rating is assigned to values which fall between the "twenty-fifth" and "seventy-fifth" percentiles and selects the two middle quartiles; whereas "four" and "five" ratings are applied to the upper quartile in the same manner as "one" and "two" ratings to the lower quartile. When applying this scale to osseous development as determined from roentgenograms, films of all girls or boys of a given age have been arranged in order of advancement, and ranks have then been assigned to the groups delimited by the appropriate percentiles on the five-point scale much as in the grouping of measurements.

When dealing with the more subjective evaluations at clinical examinations, the observer has attempted to assign ratings on the same principle. Thus, when evaluating the thickness of a fold of subcutaneous tissue over the biceps, he assigns a "three" rating if he believes the thickness would fall within the limits encompassing the middle quartiles of a large group of children of the same sex and age. He applies a "two" or "four" rating when he believes the amount is less or more than these limits to a moderate degree and a "one" or "five" if he considers the thickness rather unusual. Since an item of this sort changes appreciably with age, the observer must have had considerable experience with the age in question before he can make such an evaluation satisfactorily. Ideally, he would practice on a large group of children of the same age at one time, but practically he must develop this experience slowly and may be called upon to rate three or four children of different ages in a single period. Evaluations in these circumstances are highly subjective, and it is difficult to obtain good agreement among different observers. The attempt to assign such ratings, however, has training value in developing powers of observation and in avoiding loose, meaningless notations in records. We have continued to require the recording of

this particular observation throughout the study even though we have developed a more precise method of measuring the thickness of subcutaneous tissue on roentgenograms, as will be described a little later. Even in highly subjective evaluations which cannot be replaced by more precise measurements, ratings of this kind may have value and significance when one wishes to compare the low and the high of the series or to select examples of unusual children. The fact that these ratings are being made periodically adds to the reliance that can be placed upon them and one can, with assurance, give a child a low general rating for a given attribute when estimates at nine out of ten successive ages are found to have been "one" or "two" values.

It should be emphasized that this type of rating is not made on an absolute scale, but rather on the basis of expectancy for age. Since this expectancy may be very different from age to age, a child may change greatly in the attribute being rated and still remain in the same percentile position throughout the growth period. Fortunately, in attempting to obtain an accurate rating for a child in regard to any general attribute, there may be several items in the records bearing upon it.

There are kinds of data which deal with findings often not present at all, possibly not normal in any degree. We have adopted a scale of "zero," "one," "two," "three," etc., to describe stages or degrees of such findings. In using this scale we have not attempted to consider age expectancy but have used the numeral to indicate a certain amount or degree of development of the item concerned. For example, in the case of pronation of the feet, a "one" rating would apply to the same amount of pronation at 5 years as at 15 years, even though on this basis "one" ratings would then be far more common at age 5 than at age 15. In the case of pubic hair, all children would have a "zero" rating prior to the beginning of pubescence, and girls would have a "three" rating at the end of pubescence, representing the triangular distribution in the female; whereas boys would normally attain a "four" rating, representing the adult male diamond-shaped distribution. In this instance, the examiner concentrates on noting and correctly evaluating the extent of development of this character without consideration of age and may, in dealing with four children of the same age, give ratings ranging from "zero" to "four."

Methodological considerations involved in the analysis of longitudinal observations of growth may best be illustrated by examining specific research problems. The problem we would like to discuss at this point is one of interpreting the over-all growth of the body in terms of the growth of different types of tissue. In our work along these lines, we have made the question still more specific by selecting body weight as a measure of over-all body size and by using standardized roentgenograms * of the lower leg as a source of information concerning amounts of subcutaneous tissue, muscle, and bone. With the question defined in these terms, the first methodological decision to be made is the selection of a scale of measurement to be used in describing the quantities of the various tissues observed in the roentgenogram. We have experimented with the following three types of measurement:

1. Thickness of the tissue measured at the broadest part of the calf;
2. Area of the tissue as seen in the vertical cross section presented by the roentgenogram;

* For details of the technique used in taking these roentgenograms, see: Stuart, H. C., et al., *The Growth of Bone Muscle and Overlying Tissues as Revealed by Studies of Roentgenograms of the Leg Area.* (a) Monographs of the Society for Research in Child Development, Vol. V., Ser. No. 26, No. 3, 1940. (b) Child Development, Vol. XIII., No. 3, 1942.

3. Volume of the tissue estimated by assuming a circular cross section at the broadest part of the calf and using a vertical dimension proportional to the length of the tibia.

The details of these methods of measurement need not concern us here, but it is important to notice the fact that the methods differ in terms of dimensionality. Appropriate units to be assigned to the three measurements are centimeters, square centimeters, and cubic centimeters, respectively. In the investigation we are discussing, it was argued that since the primary variable is weight, a cubic or volumetric quantity, the third method of tissue measurement would be most appropriate since it also is volumetric. This argument was tested by examining the observations made on 69 boys at their sixth birthday. For each boy the three tissues were measured by the three methods. These measurements were then correlated with weight with the results shown in table 1.

TABLE 1.—*Correlation coefficients between body weight and various tissue measurements obtained from roentgenograms of the lower leg based on 69 6-year-old boys*

	Type of measurement		
Tissue	*Linear*	*Area*	*Volumetric*
Subcutaneous	.32	.49	.62
Muscle	.50	.66	.81
Bone	.67	.80	.76

Although the three types of measure differ in other characteristics than dimensionality, it is of interest that the volumetric measure yielded the highest correlation in the case of subcutaneous tissue and muscle. In the case of bone, the correlation obtained with the volumetric measure was exceeded only slightly by that found by using the measure of area. The same pattern of correlations was found when the measurements of 3-year-old boys were analyzed. Inspection of the scatter diagrams (fig. 10) shows that the higher correlations obtained by use of the volumetric measure do not appear to be the result of the straightening of curved regression lines but represent a truly greater association.

For these reasons we are using the third or volumetric measure in our present studies. Obviously, one of the other measurements might be more appropriate for a study with a different purpose. The linear dimension would seem preferable, for example, in studying the insulating characteristics of subcutaneous tissue. Nevertheless, whatever the objective, it is important when dealing with physical measurements to work with dimensionally comparable

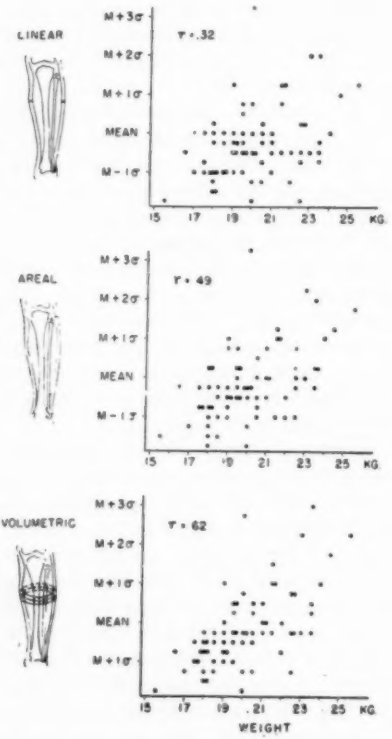

FIGURE 10—Correlation Between Body Weight and Linear, Areal, and Volumetric Measurements of Subcutaneous Tissue in the Lower Leg, 69 Boys, 6 Years Old

variables if one is to avoid the fallacy of seeking a biological explanation for an elementary physical fact.

A second methodological problem arises when one attempts to summarize the facts concerning growth over a period of time. Graphs showing the growth of individual children between the ages of 1 and 6 * indicate that during this age period the volumetric growth of all three tissues was very nearly linear (fig. 11). Consequently, we have fitted straight lines to these observations by the method of least squares and propose to study the interrelationships of the growth of each of the tissues in terms of the constants of these lines. We have also fitted straight lines to the growth in weight in this age period. Use of this method does not imply that we believe that these quantities grow at a strictly constant rate in early childhood, but simply that we believe that the linear trends are adequate descriptions for the purpose of dis-

* The upper limit was selected to correspond to the age at which a shift was made from a 3-foot to a 6-foot tube distance in taking the roentgenograms.

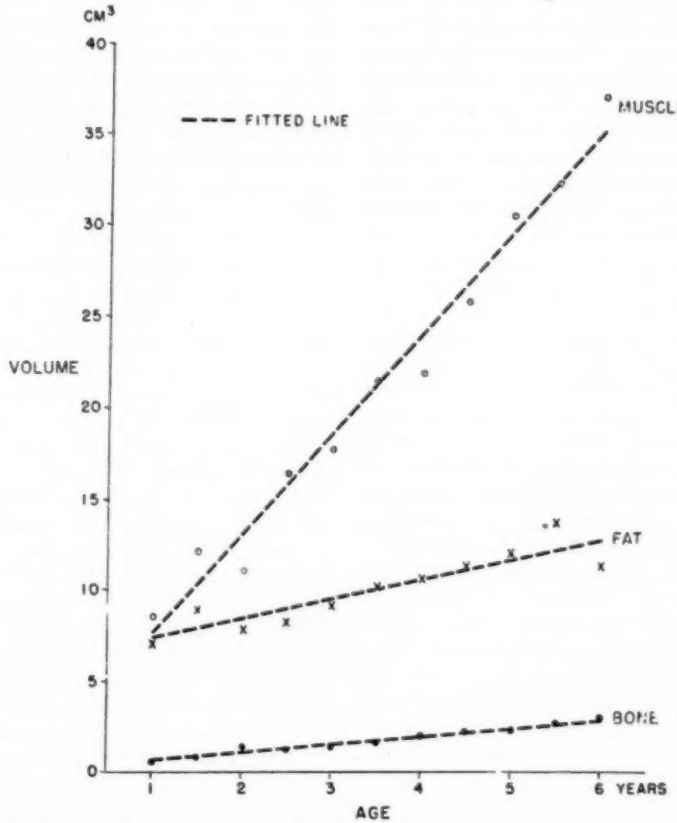

FIGURE 11—Volume of Fat, Muscle, and Bone in the Lower Leg, From 1 to 6 Years, Case 30, Male

tinguishing between the growth patterns of different individuals.

The accuracy of these linear descriptions of growth has been studied in terms of the deviations of the observed measurements from the trend lines. In general, it was found that the subcutaneous tissue showed a relatively greater variability than did muscle and bone. However, it is necessary to know the accuracy of the individual measurements in order to interpret this variability. Our best source of information concerning the accuracy of individual tissue measurements is contained in the records of 85 6-year-old children for whom we have films taken at both a 3-foot and a 6-foot tube distance. Comparison of measurements from these pairs of films indicates that in the case of muscle and bone the errors of observation are of approximately the same size as the variation about the trend line. Thus, in the case of these tissues we feel that the constants of the trend line contain all of the essential information. In the case of subcutaneous tissue, on the other hand, the observational error can explain only about one-third of the residual variance about the trend line. Consequently, we are studying the subcutaneous tissue residuals in relation to season and to records of illness and diet.

Regardless of the accuracy of the observations, the ultimate validity of this tissue study depends upon the extent to which it is appropriate to generalize from observations made on the lower leg to the tissues of the body as a whole. We hope to be able to answer this question to some extent by carrying out similar studies on roentgenograms of other parts of the body. At present, however, we are awaiting with interest the publication, by the Fels Institute, of studies of the distribution of subcutaneous tissue throughout the body.

Matched Population Records in the Eastern Health District, Baltimore, Md.: A Base for Epidemiological Study of Chronic Disease*

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THE outstanding contribution of Frost to the science of epidemiology was his clear concept of epidemiology as an analytical rather than purely a descriptive science. He considered epidemiology as fundamentally a study of the reaction of population groups to disease. True, early epidemiologists, such as Snow, Sedgwick, and Chapin, recognized population as of basic importance in the study of the epidemiology. However, the rise of bacteriology, immunology, and more recently research in the viruses led more and more workers in epidemiology to study disease in the laboratory or in the individual host rather than its impact on population groups. There is no question that these researches have proved invaluable aids to the study of epidemiology and to the control and conquest of many diseases. In studies of diseases of long duration, however, Frost developed a broader concept of epidemiology which required the follow-up of family groups over a considerable period of time. The family studies of the Eastern Health District were initiated largely because of his interest in this approach to the study of disease.

In dealing with the mass behavior of acute infectious diseases, the data have been analyzed largely in terms of age-specific incidence rates, secondary attack rates, and other rates describing the selection of the individual. Because of the acute nature of these diseases and their short duration, population facts gathered at the time of investigation of the primary or first case furnished the data required for analysis. The influence of environment in the incidence of disease has been fully recognized through comparison of morbidity rates in geographic, occupational, and other groups. The value of these statistics in planning public health programs has been demonstrated, and the methods of collecting the necessary information have become somewhat standardized in most official public health organizations.

When one turns to study infectious diseases of long duration, such as tuberculosis or rheumatic fever or the incidence and prevalence of chronic diseases, it becomes necessary to have information on families that can be kept under observation continuously or intermittently over a considerable period of time. Such analysis requires that the characteristics of all families of the study area be known. The description of a population of families is more involved than that of a population of individuals; the definition of the family is more

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difficult, and the families in a given area are constantly undergoing complex changes. Not only does migration of households occur, but the internal characteristics of a given household undergo continuous change by the addition and loss of individuals, by the aging of its members, and by variations in social and economic resources. It becomes one of the problems basic to the epidemiological study of chronic disease to measure these effects.

In the late 1920's and early 1930's Frost, Sydenstricker, and Reed held discussions which led to the desideratum that there should be available to the research workers of the School of Hygiene and Public Health at the Johns Hopkins University a population which could be kept constantly under observation. The most accurate way to study the changing characteristics of the families in the area would be to have a continuous register of households within a district, adding households as they move in, subtracting those which move out. Such a register would involve also accounting for all individuals, because when any individual enters or leaves a household, the composition of that household changes. In addition, frequent determinations of other modifying facts such as income and occupation should be made. Although such a system of records would be ideal, the difficulty of handling the detail involved in following a population of over 100,000 souls would be excessive for practical use. Further, the expense of such a project was recognized as too great to make it feasible.

As an alternate to the continuous register, it was decided that population facts obtained by census methods would be satisfactory, providing census counts were made at reasonably frequent intervals. Furthermore, the School of Hygiene needed to have access to a health unit in which students could observe and participate in public health administration and research. The Baltimore City Health Department had need of an area, likewise, in which its new personnel could receive field instruction and new administrative procedures could be tried out. These considerations, therefore, led to the establishment of the Eastern Health District which has proved of mutual advantage to both organizations.

I need to give here only a brief description of the Eastern Health District. The original area was established in 1932 as the first of eight health districts which the Baltimore City Health Department planned in order to decentralize the administration of its health services on a neighborhood basis. At that time the Eastern Health District consisted of Wards 6 and 7. In 1938 the District was enlarged to include Wards 5 and 10 and Census Tracts 3, 4, and 7 of Ward 8. The present area covers approximately a square mile and contains about 110,000 inhabitants. Fig. 1? indicates its geographical location in relation to the rest of the city. Most of the Eastern Health District studies have been confined to the original area consisting of Wards 6 and 7.

The first objective of the Eastern Health District studies then has been to assemble, through periodic enumeration of the population of the District, demographic data on families and individuals living in the District for use in measuring the impact of disease of long duration upon the population. The records of one census have been matched with those of preceding ones so that both individuals and families can be followed over a long period of years, providing they continue to reside in the District. In certain instances this record extends over a 25-year period.

The first census was taken in the summer of 1933, within a year after the original Health District had been established. Three subsequent censuses have been completed as follows: during the winter of 1935–36, the summer of 1939,

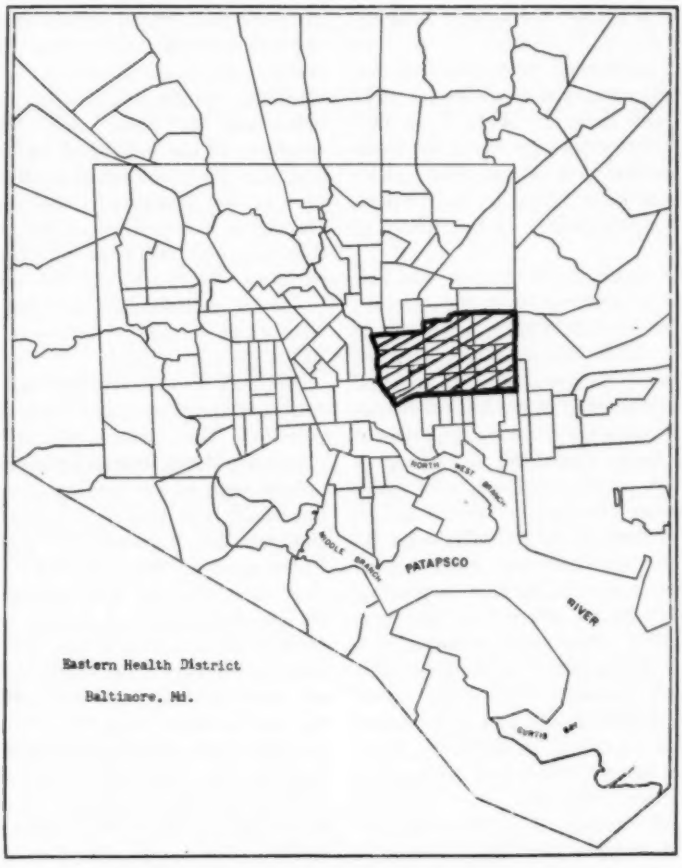

FIGURE 12—Census Tracts, 1950, Baltimore, Md.

and the summer of 1947. The enumerators for the censuses of 1933, 1939, and 1947 were public health nurses of the regular staff of the City Health Department. Because of the larger area covered by the 1939 and 1947 censuses the nurses were assisted by college students in these censuses. The 1935–36 census was made as part of the National Health Survey conducted by the United States Public Health Service. The enumerators were drawn from the rolls of the Works Progress Administration.

Except for the 1936 survey, all censuses have been planned and supervised by the Department of Biostatistics of the School of Hygiene and Public Health. The headquarters of the 1935–36 survey was also at the School, and its supervision was by persons closely associated with the Department. In all surveys, the enumerators were given special training before being sent into

the field, and their work was checked daily by a group of editors. In addition to the facts obtained at the four censuses mentioned above, information of a similar nature is available for 1922 for persons living in Ward 7 at that time. This survey was made by Doull in connection with certain field studies carried out in that year by the Department of Epidemiology of the School of Hygiene.

In all surveys, information was collected on a household basis, the members of a given household being listed on one schedule. Each individual was described in terms of his age, race, sex, marital status, relationship to head of the household, occupation, and employment status; each household in terms of owner or tenant occupied, rent paid, and number of rooms occupied. In addition to these items, miscellaneous information was collected which varied from one census to another, depending upon the special interest at the time.

The 1922 survey was concerned primarily with the history of common communicable diseases. The 1936 census concerned chronic diseases and medical care and included, in addition, statements of income, relief, and permanency of residence. The 1947 census also had questions relating to medical care received during the preceding 12 months. The 1933 and 1939 schedules were designed to give basic data describing the population. The 1939 and 1947 schedules provided information such as previous addresses, maiden names of married women, and date of establishment of household. These data have been extremely useful in tracing the records of individuals into the files of previous censuses. A summary of the data collected in each survey is given in figs. 13 and 14.

Perhaps the unique feature of the Eastern Health District censuses has been the tying together of all census records of any individual by means of a permanent individual number. The individuals enumerated in each census are checked with the master file. Identifications are made according to predetermined criteria which take into consideration the name, age, sex, and residence of the individual and in some instances the relationship to other members of the household. Collateral information is obtained from the city directory and telephone directory, and in cases of uncertainty the combined judgment of the staff is used in deciding whether or not the records were related to the same individual.

Not only have individuals been identified, but families have been likewise paired. The terms "family" and "household" have been used interchangeably in most of our studies. As used, a household is defined as a group of persons who live together as a single unit in the same dwelling, in such a manner that their sleeping quarters are under the supervision of one person, and that their food is served at the same table from a common kitchen; individuals who eat elsewhere but share the same dwelling and common sleeping quarters are also included within the household. This definition included lodgers and servants if living in. When a distinction between household and family has been made, the latter included only related members of the household. Luykx (1947) who studied permanence of residence in the Health District considered a family or household the same if (1) the head of the family is still the head at a subsequent census (where husband and wife are both present the husband is always listed as the head), or (2) the wife has become a head at a subsequent census. Although other criteria have been used for the identification of families, identification on a more complex basis has not proved as practical in dealing with the existing records.

In order to facilitate the matching of records, there is, in addition to the files

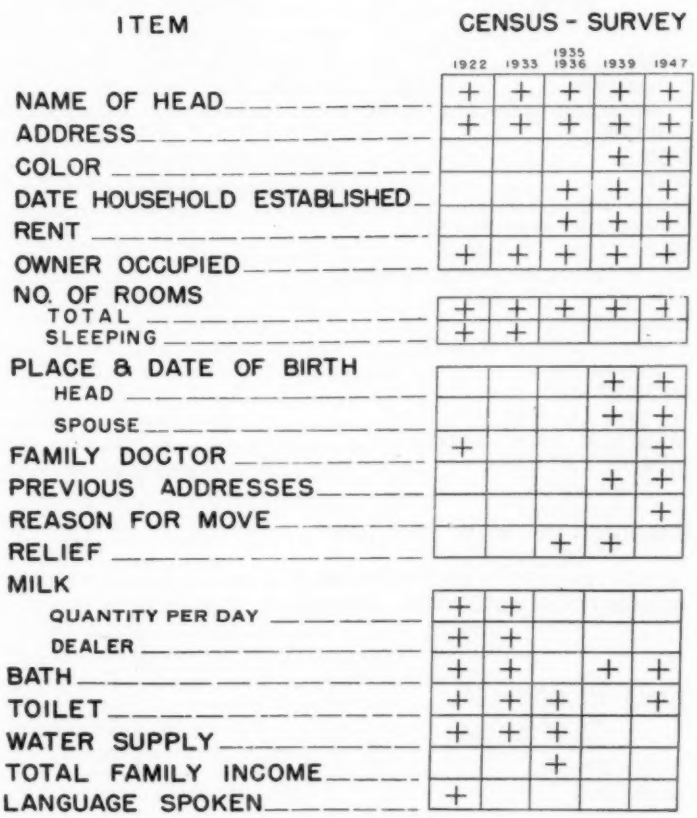

FIGURE 13—Items on Census Schedule Relating to Household, Eastern Health District, Baltimore, Md., Census Surveys, 1922–1947

of schedules taken at each census, a master index file, arranged by Soundex, of all persons enumerated at any census. For any given individual, the index card contains the schedule and individual number for each census, as well as his name, sex, race, and age. In addition, every individual has a unique number which is entered on all records. This permanent individual number has been designated as the schedule and individual number assigned him in the 1939 survey. If he was not enumerated in 1939, the schedule and individual number assigned him on the next preceding census is used as the permanent number. For a person picked up for the first time in 1947, the permanent number will be the number assigned him in the 1947 census. Deaths have been posted to this file for the earlier years, but this task was interrupted during the war.

A third major file maintained by the Department consists of a card for each address in the Eastern Health District. The surname of the head of household

ITEM	CENSUS-SURVEY				
	1922	1933	1935 1936	1939	1947
NAME	+	+	+	+	+
MAIDEN				+	+
PREVIOUS MARRIAGE NAME				+	+
COLOR	+	+	+		
SEX	+	+	+	+	+
AGE	+	+	+	+	+
MARITAL STATUS	+	+	+	+	+
YEAR OF MARRIAGE				+	+
RELATION TO HEAD	+	+	+	+	+
DATE ENTERED HOUSEHOLD			+	+	+
COUNTRY OF BIRTH			+		
EDUCATION			+	+	+
EMPLOYMENT STATUS			+	+	+
OCCUPATION	+	+	+	+	+
INDUSTRY	+	+	+	+	+
VETERAN STATUS			+		+
MEMBER SICK BENEFIT			+		
IMMUNIZATION					
SMALLPOX		+	+		
DIPHTHERIA		+	+	+	
AMOUNT OF MILK PER DAY		+			
— ILLNESS —					
HOSPITALIZED LAST 12 MOS.			+	+	+
NUMBER OF DOCTORS CALLS					
HOME			+		+
OFFICE			+		+
CLINIC (HOSPITAL / OTHER)			+		+
DAYS IN HOSPITAL			+		+
" IN BED			+	+	
" NOT IN BED			+		
OPERATION			+		
NURSING					
DAYS			+		
VISITS			+		
LAST VISIT TO DENTIST					+

FIGURE 14—Items on Census Schedule Relating to Individual, Eastern Health District, Baltimore, Md., Census Surveys, 1922–1947

and schedule numbers of the households residing at that address in each census are posted to these cards.

The data available in tabulations and on punch cards describe the population and families of the Eastern Health District in great detail and afford unusual opportunities to study changes in family composition and characteristics with time. A secondary use of the records has been to evaluate the reliability of information obtained in house-to-house canvasses of the population and to study the dynamics of family and population movement as revealed in successive censuses. These studies have been made possible because a given individual or family has been matched with those in preceding censuses. Densen (1940), Rider and Badger (1943), and Luykx (1947) have published studies in these fields.

We are more concerned today, however, with the use of the material in epidemiological research in the incidence and prevalence of disease and in the field of medical care. The periodic censuses obtained data on illness only incidentally if at all, but were designed primarily to secure basic population facts. The various departments of the School have carried through and have in progress a number of investigations in which the records of the population of the Health District have been utilized. Many of them have been essentially epidemiological in nature and required accurate knowledge of the population over a period of years. Recent studies have been directed towards the dynamics of chronic disease incidence in the community. Mental disease, tuberculosis, syphilis, rheumatic fever, and degenerative diseases have been studied at one time or another.

No single method has been used in these studies of morbidity, although classification of both population and cases in terms of family characteristics has been frequent. The general premise has been that with the intimate knowledge of the families and individuals which is available from the matched census records, this information may be dipped into in many ways. As a first step both population and cases have been classified into various groups depending on the presence or absence of some characteristic or factor, or into groups arranged according to some appropriate scale. Incidence, prevalence, and other pertinent rates for each group are then computed. There is no more effective way of measuring the epidemiological significance of such factors than this direct approach. The population records of the Eastern Health District have also been used for drawing a random sample of the general population of the District to serve as a control in studying the incidence or prevalence of a disease in a particular group of the population. A partial list of such subgroups follows:

(*a*) Owner - occupied vs. tenant - occupied households;
(*b*) Migratory vs. permanent households;
(*c*) Size and type of family;
(*d*) Age, race, occupation of head of household;
(*e*) Degree of overcrowding;
(*f*) Rental groups;
(*g*) Tuberculous vs. nontuberculous households;
(*h*) Syphilitic vs. nonsyphilitic families.

Knowledge of the cases to be studied in relation to the population files has been secured by tapping all sorts of medical sources. All cases which will enter any given study must be persons identified in the census records as living in the Health District during the period covered by the study. Identification is made either by starting with the names of individuals known from the census records to be in the District or by checking the cases against the master index. The choice of procedure depends on the nature of the study and the availability of the records which will be used.

In the study of chronic diseases it must be recognized that the people of any community receive medical care from a wide assortment of facilities. Private physicians, out-patient departments, public and private hospitals, health department clinics, private and public laboratories, and numerous other agencies all play their part in the diagnosis and care of patients. Experience has shown that in order to get complete information on all cases, the records of all such groups must be drawn into the study. For example, the syphilis studies of the Eastern Health District have been based largely on the syphilis register which has been maintained since 1936. An effort was made to collect for each year since 1932 the names and other identifying data on all residents of the District who came under medical observation or treatment for syphilis

during that particular year. A master name file was established which included identification of the individual in the census records and the presence or absence of syphilis. The principal sources of information were reports of serologic tests done in the laboratories serving the population, cases reported to the Baltimore City Health Department, either directly or through the city laboratory, cases discovered and treated in a number of the large hospitals within and close to the District, cases admitted to the venereal disease clinics operated by the City Health Department, and cases brought into the study through data collected in personal interviews with physicians practicing among the residents of the District. As a consequence, for a large proportion of the population of the District the syphilis status, negative or positive, is known over a period of time. In one study, these data—supplemented by special serologic examinations of those whose status was not known—were used to determine the prevalence rate of syphilis among Negroes 20–24 and 35–39 years of age.

The diagram given in fig. 15 may help to illustrate these procedures. The large circle represents the population records secured through the various censuses of the Eastern Health District. The smaller circle represents the universe of cases or other data which are to be related to the population. The first step has been to identify these cases in the census records of the District's population. Not all cases will be matched, since some of the cases occur among persons now living in the District but not there at the time of the census. The identified cases are represented by the portions of the two circles which overlap. These are the cases which will enter the study and be related to the population of the District. The method assumes that if any person living in the District during the study period had had a medical record for the disease studied, this record would have been matched with the population record. This procedure permits the study of the cases in relation not only to the facts secured at the time of examination but all facts concerning the individual and his family at each census and any other data which have been linked to the census records.

Another illustration of the use of the census records was the study by Councell (1943) of the amount of hospitalization which a sample of 10,000 persons enumerated in the 1936 survey had had during the period 1926–35. The procedure in this case was that the names of the individuals in the sample were checked with the in-patient records of nine hospitals, and all admissions during the 10-year period were abstracted for study. This study was a retrospect one and suffered the defects which will be found in all such studies. Fatal conditions are underrepresented. A study now in progress is carrying the study forward to 1947.

In the 5-year morbidity study of the Eastern Health District conducted by Collins and Downes (1940, 1949), the initial record of illness was obtained from the housewife by means of monthly visits to 2,000 families living in a random sample of blocks of the District. Verification of diagnoses and further data on medical care were then obtained by visits to attending physicians, hospitals, and clinics that had furnished the care. The results of this study are published in a series of papers by Collins, Downes, and their coworkers in the *Milbank Memorial Fund Quarterly, Public Health Reports,* and elsewhere. The generalizations from these data can be more widely extended because of the known relation of the sample to the total population of the District.

By these techniques, during the past 18 years the Johns Hopkins School of Hygiene and Public Health, in cooperation with the Baltimore City Health De-

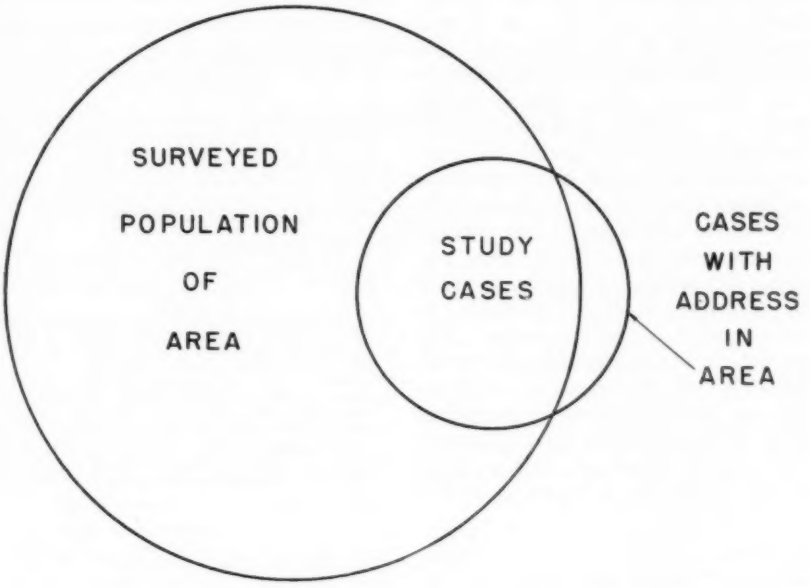

FIGURE 15—Diagram Showing Relation Between Population and Study Cases

partment and the physicians and families of the Health District, has carried out numerous studies on the incidence and prevalence of disease in the families of this area. The three basic elements of the method are (1) detailed and periodic censuses of the population of the District to determine its distribution and composition in terms of households or families; (2) the linkage or matching of individuals and families with those enumerated in previous censuses; and (3) the collection of data on the occurrence of various diseases and other medical or social phenomena in individuals identified in the population records. In some instances the population records of a given census have been used as the population base for the study; in other cases, the matched population records have enabled us to compute exposure data in terms of person-years for individuals remaining in the area varying periods of time.

In developing the analysis of these data many statistical problems have arisen in reference to the definition of the groups chosen for study, cases to be included in the study, and exposure time. The contribution of Frost in pointing out the need to exclude in many instances the "index person" in the calculation of incidence rates and the use of modified life-table techniques in computing person-years of exposure is well known. Gauld, Reed, and Merrell have fully discussed the "index person" in their paper "The Index Person—Relation to Incidence Rates in Family Studies," *American Journal of Public Health,* June 1942. Likewise, I need not go into the use of life-table techniques in computing per-

son-years of exposure, since a description of these procedures can be found in the published studies of the Eastern Health District and those of Frost's students where the same techniques have been applied to data from other areas.

In summary, then, the morbidity studies of the Eastern Health District have been a series of special studies of diseases as they occur in a population of known characteristics. Because the population data secured at periodic censuses have been linked from one census to another, it is possible to study the occurrence of disease in relation to the dynamics of the population. The war interfered considerably with the full utilization of the material available, but the intimate knowledge which we have of this population is such that any study of the genesis of chronic disease in this population is bound to be tied directly to these records. The School of Hygiene is now exploring the possibility of making fuller use of these basic data and the continuance of the periodic surveys of the population.

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Recent Long-Term Morbidity Studies in Hagerstown, Md.

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Origin and Development

THE Hagerstown studies originated in 1921 with a survey of the frequency of sickness in 2,000 randomly selected families. The survey extended over a period of 3 years and covered 7,800 individuals representative of the age, sex, and socioeconomic composition of the community. Interviews were conducted at intervals of 6 weeks over periods ranging from 1 to 3 years. During the same period, school absences for illness, anthropometric measurements, physical defects, and dental examinations were recorded for 4,000–7,300 school children.

For 5 years following 1923, annual measurements of height and weight were made on Hagerstown school children, and the results were published in a series of growth studies. During the same period, morbidity records of children were maintained. Later, in 1928, an audiometric survey was conducted to determine the extent and nature of hearing defects in a cross section of the school population.

Five years later, Public Health Service investigators returned to Hagerstown and resumed the studies on growth of school children. The results were compared with earlier measurements to determine the effect of the economic depression on growth. Starting in 1935, immediately following the growth studies, records were kept on the morbidity of school children for a period of 2 years. These records were later used in a study comparing child morbidity at three different periods of time.

Up to this point these surveys and studies were independent and were largely planned without interrelationship in content or objectives. But all the original records are still available.

In 1937, the child hygiene office undertook a series of integrated studies of school children. The concept of follow-up or long-term studies developed shortly thereafter, and the local office of the U. S. Public Health Service was established on a permanent basis. The observations recorded since that time have been of three classes: (1) systematic studies of various aspects of child health, (2) by-product data of special health activities preserved on the assumption that they might have eventual usefulness, and (3) data collected for the purpose of comparison with earlier records, i.e., for long-term studies.

The list of items is imposing. In addition to further school morbidity records, dental examinations, and height-weight records, there are data from chest X-rays, heart examinations, illness and death from cancer, Selective Service examinations, pneumonia antigen immunizations, hearing and speech surveys, venereal disease records, mortality records of husbands and wives, marriage and divorce records, and the results of a 1943 re-canvass of the sur-

viving families of the 1921–23 survey. A full list of the studies appears as the appendix. During the past decade the staff has been engaged part of the time in organizing the records into a family file in order to facilitate further analyses. This project is nearly completed.

It can be inferred that cooperation between local authorities and physicians and the U. S. Public Health Service staff has been excellent. All data requested by the staff have been made available. In exchange, the staff has rendered service in kind by assisting local health agencies in the development of forms and record systems and in tabulation and analysis of data for administrative purposes. Cooperation is maintained, in part, through a planning committee composed of three members of the medical society, the County Health Officer, and the head of the Hagerstown office of the Public Health Service. Proposed projects are discussed by this committee which tells Hagerstown physicians about the aims and information desired and asks them to cooperate in furnishing the necessary data, with the understanding that all material will be confidential. In the case of projects which involve a canvass of households, it is equally important that physicians know about the project and its aims. Thus it is possible to avoid embarrassment of the physician when patients tell him that they have been called on and question him about the purpose of the study. The smoothness of relationships over the years should not be interpreted as license to neglect the matters just described.

Methodological Problems

Long-term or longitudinal studies conducted or in process thus far include: a comparison of Selective Service examination defects with defects recorded among the same individuals when they were school children in 1922–28 [1, 2]; a study of chronic sickness in relation to survivorship 20 years later [3]; an estimate of the incidence or rate of occurrence of new cases of chronic disease [4]; a report on chronic illness in families in relation to changing economic status [5]; the socioeconomic and illness histories of indigent medical patients; chronic illness in relation to morbidity 20 years later; and a study of incidence of cancer in several generations of families. These studies have been sufficient to reveal several problems of methodology, some of which appear as problems peculiar to longitudinal studies.

Validity of reporting is, of course, the fundamental problem in all illness studies. Hagerstown data have been collected in a variety of familiar ways: house-to-house canvass; physical examinations; school, hospital, clinic, and health department records; verification with physicians; and death certificates. For the most part efforts to obtain complete and accurate data have been no different from those of other careful studies. An advance may be found, however, in the current study of familial cancer which is using reports of household informants, physicians, hospital records, cancer registers, and death certificates, checking each source against the others.

Partly in an effort to obtain a complete record of chronic illness prevalence, the original 1921–23 interviewers made repeated visits over a period of more than 2 years, on the assumption that occurrence of acute phases would lead to fuller reporting. The 1943 re-survey, however, was a one-stop canvass. A surprising and thus far unexplained finding of the comparative data is that 60 percent of the surviving persons reported as having chronic conditions in 1921 were reported as having no illness in 1943. An additional 28 percent complained of some other disease in the second survey. Differentials by diagnosis are being studied. It will not be possible, however, to determine from

existing data whether the phenomenon arises from change in informants, from actual recovery, from "recovery" from a psychosomatic illness after the passing of an emotional situation, from having lived so long with illness that it becomes part of one's normal life, or from the presence in 1943 of a more serious or painful disease "preferred" by the respondent over the original condition. Whatever the explanation, the phenomenon itself indicates that intervals between surveys should be shorter and that procedures for obtaining specific diagnoses should be more objective.

We are inclined to the position recently stated by Collins and Woolsey[6] that further advances in valid sickness reporting by diagnosis for a representative sample of the population will occur only after the introduction of new techniques, and that this position is particularly applicable with reference to longitudinal studies requiring frequent reporting. Two techniques which should be followed closely are: (1) the multiple screening examination,[7, 8] and (2) the symptom check list.[9] Both are still in exploratory stages and merit considerable attention. Maintenance of health counseling centers for families[10] or for middle-aged and older people could also be useful sources of data if they are established in this country.

The familiar problem of reporting validity with reference to the relationship of the informant to the person reported upon arises in a new light. Housewives reported on their children in 1921, but by 1943 many of the children were adults reporting for themselves or being reported upon by wives. Moreover, the grown-up children of 1943 were often called upon to report for their aged parents who were the informants of the earlier period. Current Hagerstown studies indicate that informant relationship is a significant factor and, hence, it must be presumed to influence the findings of long-term studies. It is quite possible that the high proportion of persons presumably ill in 1923, but who were reported well in 1943, may be due to this factor. In the earlier survey these people were, for the large part, reported upon on the basis of their parents' observations, whereas in the second survey they reported their own physical status or that of their spouses.

A variation of this problem is that 1943 informants were asked to report on persons who had lived apart from the family for any number of years up to 20. The Hagerstown staff has compared chronic disease prevalence rates in 1943 among persons living in the same dwelling as in 1923, among persons living in the city but in a different dwelling, and among persons living outside the city. When age is held constant, chronic illness rates were, in this instance, nearly identical.

This finding would indicate that the volume of chronic illness due to all causes was approximately the same whether persons being reported upon resided in the same household or resided elsewhere in 1943. However, the same data indicate that the informant's knowledge of specific disease diagnoses is less complete for persons who had moved away. Illnesses of unknown cause constituted 5 percent of all illnesses among persons living in the same house as in 1921–23, 9 percent among persons in a different house in the city, and 35 percent among persons who had left the area and who, consequently, were largely reported upon by remaining relatives. This relationship holds irrespective of age.

A problem peculiar to the long-term study is that the original population cohort declines from year-to-year, by reason of emigration, death, or other separation. For some types of studies considerable reconstruction can be accomplished by using nonmigrant rela-

tives as informants; by following the individuals themselves, if they are not too far away; and by use of death certificates. Children who have left the family can be traced to their new homes. There will always be, nevertheless, a residual of families and persons who have disappeared altogether. The question then arises as to what biases may have been introduced into the cohort surviving at subsequent periods. Analysis is now being made of the 1921–23 illness prevalence and of other characteristics of families who had disappeared completely by the time of the re-survey for comparison with similar data for those who were located or traced in 1943.

The problem of the interval between observations in long-term studies, already mentioned in connection with validity, arises in at least one other situation. In a study on the incidence of chronic diseases, for example, it was necessary to estimate the rates of occurrence of new cases for shorter periods of time by interpolation between the periods of actual observation. Thus, in order to get true incidence rates, the period between observations should be short enough to obtain the time of onset of an illness or disability with a reasonable degree of reliability. Collins met this problem in the Eastern Health District study of 1938–43.[11]

The Promise of Longitudinal Studies

The Hagerstown Studies have been pioneers in revealing the needs for, and difficulties encountered in, long-term studies. Many of the aforementioned problems can be avoided by setting up studies which are initially designed as long-term in nature and planned to provide such knowledge as can be obtained only through a longitudinal method of approach. We suggest three broad areas in which such studies have much to offer.

Incidence and progress of chronic illness.—With the increasing emphasis of public health on chronic diseases, well-planned longitudinal studies are needed to provide information on the incidence and progress of these illnesses. At present, knowledge of the incidence of chronic illnesses is meager. The re-survey material in Hagerstown has provided general information on the age-specific rate of occurrence for all chronic complaints combined. Yet further information is needed on the incidence, by age, of specific illnesses and on the rate at which such illnesses become handicapping or disabling. It is also desirable to know the frequency of attacks of acute phases of chronic diseases. Such figures would provide an intelligent basis for planning medical care programs and health funds. They would give a foreknowledge of the needs for chronic disease hospitals, equipment, and personnel. They would provide basic data with which to plan gainful employment for the aged and retirement and activity programs.

Changing patterns of chronic illness may result not only from actual changes in the incidence of disease or from shifts in the age distribution of the population. They may also arise because of changes in diagnostic terminology or developments in the quality and extensiveness of diagnostic techniques. Since the events leading up to chronic illness, methods of detection, and the course of disease are dynamic in nature, frequent longitudinal observations are the only practical method of obtaining reliable information.

Illness and socioeconomic factors.—The two-way relationship of sickness and socioeconomic factors has been of concern for a long time, but there is less known about it than remains to be discovered. The principal reason is that sickness and the individuals and circumstances in which it occurs are complex and dynamic in nature. The order of events, if not actual processes, must be observed in time sequence, and this is

the essence of long-term or longitudinal studies.

One of the challenging problems is that of unraveling the long-known association between illness and related factors. The association is not altogether clear-cut as to total illness save for the lowest income families. Downes finds considerable evidence, however, that some conditions such as rheumatic fever, pneumonia, and tuberculosis find a favorable environment among low-income populations.[12] Perrott and Sydenstricker found that families which had suffered severe income losses during the early 30's tended to have more illness than other families.[13] It was not until the 1921–43 Hagerstown data were analyzed, however, that low-income status was shown to be a definite consequence of chronic illness. Present conclusions are based on a small number of cases and the data are subject to the limitations mentioned earlier. The findings should be verified through further studies and the actual process examined in terms of extent of disability, wage losses, treatment costs, and other explanatory factors.

Lowered economic status is only one of the probable effects of illness on individuals and families. General observation, at first, and, more recently, actual studies have shown that families with health problems are more likely than others to have problems of maladjustment, disorganization, and delinquency.[14] Families may have to modify aspirations for their children and suffer loss of status in the community. An afflicted breadwinner may lose self-respect and his normal familial role. The list of possible effects could be extended; enough have been mentioned, however, to indicate that there is a significant role for the longitudinal study.

The reverse of the situation just mentioned is the influence of social and economic circumstances in producing illness. It has long been supposed that certain concomitants of low income, such as inadequate housing, lack of education, insufficiency of medical advice, and undernourishment, may give rise to certain types of illness. In some instances, such as pellagra, the evidence is quite clear[15]; in others, such as housing, the actual chain of conditions has not been demonstrated[16]; and in still others no association has been shown. The current Hagerstown study of cancer is expected to indicate whether there is a tendency toward familial concentration of this disease as has been shown for chronic conditions in general.[17] Observations are being extended over three generations. Whether or not techniques now available are adequate to identify psychosomatic conditions and possible family concentration is open to question, but it would seem worthwhile to test them.

The practical values of longitudinal studies of the types suggested above are obvious to all who are concerned with the various manifestations of social pathology and with the possibility of decreasing the proportion of diathetic, indigent, maladjusted families.

Illness and treatment programs.—Longitudinal studies can be employed to throw further light on numerous questions regarding the use and effectiveness of treatment programs. One group of questions would include such items as: How do people discover the need for diagnosis? How long do they wait to get it? If it is postponed, why? Where do they go and how do they decide where to go? To what extent do people make use of detection centers and other facilities for regular and free diagnostic services? Similar items revolve about the question of obtaining treatment once a diagnosis has been made.

Another set of problems has to do with the effectiveness of diagnosis and treatment. Can the frequency of attacks be retarded? Can symptoms or conditions

be cleared up? What differences can be observed in the course of sickness and in mortality rates of those who do and those who do not obtain diagnostic and treatment services?

The relationship of costs of treatment to its receipt, to how or where it is obtained, and to source of funds to pay for it represents a further area of investigation. What does treatment for specific conditions cost and how do people meet the costs? Since these conditions may be spread over a number of years, the longitudinal study may be the best device for collecting information.

Another area in which very little is known is that of medical and related treatment for the family of the individual with a disabling chronic condition. In prescribing treatment for an extended, expensive, disabling condition of the breadwinner, the housewife, or any member of the family, what attention is given to the effect on the total family unit? Is home care or hospitalization recommended with reference to its effect on the family? How frequently are other services, such as financial assistance or counseling, needed? Do families get them? How do they get them? How do they come to the attention of nonmedical agencies? In this case, as in others, family interviews would have to be supplemented with records of agency services.

Conclusion

Many of the problems identified above have been investigated by means of the conventional cross-section study; indeed it is through such studies that the problems have been defined. It is our belief that further progress depends upon use of methods involving frequent interviews conducted through extended periods of time and more objectively reported diagnoses.

Either of two basic sampling methods may be used. A representative initial cohort may be followed over such period of time as may be required. Observations can be limited to the original members of the cohort or extended to those added by marriage and birth. Migration out of the community would not affect the representativeness of the cohort, though in-migration would. For several of the studies mentioned, continuing representativeness would not be essential.

When a sample continuously representative of the community is necessary, it can be selected and re-selected on a geographic basis. A sample of this sort would not retain the same families or individuals except by chance.

One problem of a longitudinal study, particularly of the cohort type, is that repeated interviewing and questioning regarding health practices will of themselves improve practices. This limitation might well affect some types of studies but not all.

Frequent interviewing undoubtedly enhances the reliability of reporting sickness data but not the validity. Informant reporting, as in past studies, will be satisfactory for some purposes, but most studies involving prevalence or incidence of specific diagnosis will approach accuracy only as more objective reporting is developed. New techniques of mass diagnoses and symptom reporting should be explored thoroughly.

As a final word it should be observed that longitudinal studies will not increase in cost in direct proportion to the frequency of interviewing or the length of the time period covered. Long periods of repeated observation of a small sample will produce as many observations as one-stop interviews of a much larger sample.

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APPENDIX

Data on file in Hagerstown office of the Public Health Service:

1921–1928

1921–1924 Health Survey (7,800 persons, 2,000 families). Original data sheets and punch cards which include illnesses, economic status, condition of housing, sanitation, etc.

Childhood Morbidity (7,313 children). Records of absenteeism from school.

Physical Examinations (5,233 children). Anthropometric data and obvious physical defects, including corrective measures where applied.

Dental Examinations (4,057 children). Dental charts and defects of school children.

1933–1937

Height-Weight (9,266 children). Longitudinal height-weight records for school population.

Childhood Morbidity (4,342 children). Records of cause and duration of absence from school.

Anthropometric Data (3,551 children). Physical measurements and body build indices.

1937–1942

Height-Weight (12,400 children). Longitudinal records on school children with growth increments.

Childhood Morbidity (17,342 children). Record of cause and duration of absence from school.

Dental Examinations (14,163 children). Dental charts and other data showing defects.

Chest X-ray (9,768 children and adults). Records give date, number, and interpretations. Corresponding 14x17 plates on file.

Tuberculin Test (3,781 children). Results of both P.P.D. and O.T. tests with X-ray interpretation on same record.

Heart (2,407 children). Electrocardiographic and stethographic measurements. Tracings on file.

Physical Examinations (1,456 adults). Regulation selective service examinations by local physicians.

Mortality of Husbands and Wives (2,758 couples). Dates, ages, and causes of death of each couple. An additional 9,000 unpaired mortality records are also on file.

Marriage Records (15,078 couples). Names, ages, occupations, date and place of marriage, 1898–1938.

Divorce Records (2,600 couples). Names, ages, and occupations. Date and place of marriage and divorce.

1942–1949

Pneumonia Antigen (27,000 persons). Identifying data and dates of inoculation from 1940 through 1945, with concurrent data on pneumonia cases.

Family Composition (18,000 + families). Each card lists a family, giving names, birth dates, relationships and an index to Public Health Service records for each individual.

1943 Health Resurvey (1,600 families). Records of a resurvey of persons in the 1921–1924 survey. Includes location, state of health or illness, cause of death, economic data. Also recorded on punch cards together with certain of the 1921–24 information.

Cancer Records (450 families). Records of cancer cases and deaths in three generations of selected families.

Chest X-ray (18,900 persons). Film, data cards, and tentative diagnosis from mass X-ray surveys of 1948 and 1949. Retakes and final diagnosis on 14x17 plates.

Discussion

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SINCE the subject of this morning's session is Methods in Long-Term Studies, emphasis will be placed on methods distinctly involved with analysis of longitudinal data. Diagnostic problems are common to all investigations and thus are not discussed in detail at this time. The first part of this discussion is devoted to the methods concerned with longitudinal data in the three papers which have been presented. In the second part of the discussion some of the important factors to be considered in a long-term epidemiological study are listed as a brief summary on the subject.

THE THREE PAPERS

Longitudinal Aspects of Child Health and Development.—The main portion of this paper by Stuart and Reed was devoted to the methods of rating attributes so that growth of children over a period of time may be evaluated. Children grouped according to the relative ratings of attributes on a five-point scale can be studied for a long period of time.

In the latter part of the paper a method was proposed for assembly of observations for a period of time in the long-term study of growth at Harvard. For analysis of longitudinal observations of growth, the authors found that the volumetric growth determined by measures of all three tissues (subcutaneous, muscle, and bone) of the lower leg was very nearly linear. Constants obtained by fitting straight lines by the method of least squares may be used in distinguishing between the growth patterns of different individuals. The accuracy of the individual measurements is being studied and in the case of muscle and bone the constants of the trend line are believed to contain all of the essential information.

If this proposed method of fitting straight lines to the volumetric measures of tissues obtained over a period of time proves satisfactory, a method of combining these observations of children can be developed whereby the relationships of illness and disabling conditions to growth patterns can be determined.

For discussion of the value of this method I wish to ask Dr. Stuart or Dr. Reed the following questions:

1. For what age spans and/or intervals in years is growth linear so that a straight line is satisfactory?
2. How have you combined the data for individual children so that the material can be evaluated for a time period?
3. Have you used results either from the ratings of attributes or from the measures of tissues for calculation of illness rates and incidence rates of mental, emotional, or other conditions?

Since the effect of the growth pattern on health is a primary objective and we are discussing the methods of evaluating such long-term data, study of incidence rates of illness and other conditions considering the growth pattern would be most revealing. No doubt the analysis has not progressed to this point or the authors would have provided us with results. However, for studies of growth in relation to health, these considerations seem important.

Matched Population Records in the Eastern Health District of Baltimore, Maryland.—Frequent censuses of the population with matching of the records was the method used in the Eastern Health District for obtaining the population base for long-term studies. It was recognized that the ideal plan would in-

volve an accounting of all individuals and households in the nature of a continuous register. Unfortunately this ideal plan has not been tried. A good demonstration of a long-term study of the development of disease in an entire population group (preferably a small one) kept under close observation is needed.

In the Eastern Health District, studies are made of the experience of individuals known from the census records or the cases are checked against the master index so that the population data can be utilized. Fig. 15 has shown us how cases are related to the population. The small number of cases not located in the population (the new arrivals) was excluded. The population records have been used for drawing a random sample to serve as a control in studying the incidence or prevalence of a disease in a particular group. There is no doubt that population data from frequent censuses as used in the Eastern Health District provide an excellent base for many different types of studies. As an extension from their experience, it seems logical that other studies should make greater use of census data and the census method.

There are several questions I should like to ask Dr. Fales for the sake of future studies.

1. If you and Dr. Reed were planning for a long-term study of the epidemiology of disease at this time, on the basis of 20 years of experience with frequent censuses, would you make the decision made 20 years ago?
2. Do you feel that greater use of census data for studies of the epidemiology of disease should be made in other areas?
3. You have mentioned briefly the 5-year morbidity study conducted by Downes and Collins with records of 2,000 families. For the benefit of this group can you give us recommendations from that study to incorporate in our discussion of methods in longitudinal studies? For instance, how large should a group be, was monthly visiting necessary, was the period long enough?

Recent Long-Term Morbidity Studies in Hagerstown, Maryland.—A tremendous amount of material has been collected in the Hagerstown studies from which outstanding contributions to the methods of long-term studies have been made.

The following four methodological problems have been stressed.

1. *Validity of reporting.* The use of multiple screening examinations and symptom check lists was suggested as means of improving the quality of the data.
2. *Changing the informant.* It is believed that this difficulty can be overcome by frequent visits and contact with all or nearly all members of the families—especially those with illnesses.
3. *Loss of the original population.* A long-term study can be designed so that the population can change. Account has to be taken of these changes in the population base—the person-years.
4. *Interval between observations.* This interval should be short enough so that the time of onset of an illness or disability may be obtained. In the 5-year study in the Eastern Health District, monthly visiting was scheduled. In our study of tuberculosis in Williamson County every household must be checked yearly for changes in composition in addition to yearly examinations of all persons and more frequent examinations of cases and suspected cases.

The authors stress the fact that these problems may be avoided by setting up studies which are initially designed as long-term studies in nature. This seems to me to be a most important point. Investigators are continually trying to go back into records and learn something for which the records were not designed, often in terms of life experience. This is not sound planning. Long-term studies need to be carefully designed in advance of the collection of data.

PRINCIPLES IN LONG-TERM STUDIES

From the experience of those participating in the discussion today, it seems to me that we ought to develop some principles for the guidance of those who may refer to the report of this confer-

ence. Several points will be listed, others may be added from the discussion which is to follow.

1. The study would be initially designed as long-term in nature. It would not be retrospective because of the deficiencies usually found in data for the past.
2. The objectives of the study should be clearly stated and the means of fulfilling those objectives developed as part of the original planning. This includes consideration of the size of the group and the period of time necessary for conclusive results.
3. The population group to be followed may be one of the following:
   (a) An entire population group;
   (b) A sample of a population;
   (c) Households or families selected because of a given case of a disease (such as an index case with tuberculosis, rheumatic fever, or cancer);
   (d) A group of persons with a specific disease or condition placed under observation for long-term study (such as cases of cancer, heart disease, tuberculosis, etc.).
4. All available diagnostic means such as multiphasic testing, symptom check lists, and other examinations should be utilized to ensure validity of the data and significance of the results for a period of time.
5. Frequent observations of the group being followed should be planned. Records should be designed with spaces for checking the status of each person included in the group at specified intervals.
6. Current analyses of the material being collected in long-term studies seem essential to me. Collection of data in the hope of its eventual usefulness is not sound planning. Analyses are useful in guiding the program.
7. The type of analysis has been mentioned only incidentally in the discussion. Perhaps it is accepted that incidence rates are to be calculated by dividing the new cases of a given disease or condition by the person-years of observation, taking into account the time period of observation of each member of the group. However, the fact that the population base changes and the initial population cannot be used needs emphasis. The adaptation of life-table technique as developed by Frost needs to be understood by those undertaking long-term studies for calculating attack and death rates. For analysis of the life experience of a group of cases another adaptation of life-table technique, that is, calculation of the probability of death and survival, is suitable for certain studies.

Discussion

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THE first paper offers an ingenious method of measurement which may be applicable to studies of growth and development and it also presents methods of rating both "normal" and "abnormal" human attributes. Yet, insofar as the presented data are concerned the title is somewhat misleading. The authors are no doubt prepared to expand the discussion to include the title's inference and the implications of the first two paragraphs relative to health and to the influence of health and environment upon growth and development.

It will be interesting to learn more of the meaning of environment as used here and also whether ratings similar to those for normal attributes have been worked out for environment and for health in order to make comparisons with the growth variables.

Such a scale for health is most difficult to construct since everyone will have health of one kind or another and since health is an entirely relative state. The authors' five-point scale for so-called normal attributes does not actually attempt to define the limits of normal, nor does it set up normal standards; yet there is some doubt that the same scale can be applied to health. There is, however, an indefinite arbitrary line or band between the more or less accepted limits of the normal and the abnormal—the so-called margins of safety, limit of tolerance, borderline of disease, etc. If diseases were static entities rather than processes, these limits could be defined more easily. But disease is a process, and unfortunately it must be admitted that it cannot be accurately defined. The so-called "textbook pictures" of disease are in reality not fixed and rigid entities as the descriptions would lead to believe. The so-called classical descriptions of disease are complex processes that have certain features in common which permit them to be grouped for convenience. We may be left, therefore, with the fact that these relative terms, health and disease, should be used more for convenience than for scientific accuracy.

With respect to the scale used for rating development, it is not clear why the 1 to 5 scale used for normal attributes cannot also be used for such attributes as pubic hair. This is normal except when it appears too early or too late or when a male develops female distribution or vice versa. It is clear why pronation of feet should be rated 0 to 3, etc., but the question arises as to whether this constitutes part of the scale of health or fitness.

Finally, there are some simple questions relative to measurement of the lower leg: Which leg is used? What is done when there is disease atrophy of the "index leg" or deformity of bone? What are the effects of temperature, salt intake and fluid balance on the measurements?

The matched population records of the Eastern Health District of Baltimore afford a unique opportunity for long-term population studies. As pointed out by Dr. Fales, a large series of special studies of disease in this population has been made. The question immediately arises, however, as to the practical application of these studies for general use elsewhere. The population records have provided denominators for numerous studies relating to this particular population. They have furnished "work shop" material in epidemiologic and statistical

methods for numerous students. They have been responsible for the development of methods of measurement of one kind or another and have produced methods for use in long-term studies. An estimate of how many such generally applicable methods have been produced and some statement as to how widely they have been used would be of considerable interest to this group. I can cite at least two procedures for general use that have risen as a result of these studies, both relating to the trend of syphilis: (1) syphilis in parturient women as an index of trend of syphilis in a community, and (2) syphilis of all stages in young adults as a similar index of trend. Perhaps Dr. Fales or others might care to elaborate upon the point of general application of the methods derived from the Eastern Health District studies. Does the experience there indicate the need of similar study areas elsewhere?

One of the most serious difficulties in long-term studies, retrospective and prospective, is that of identification of individuals from one time period to another. Have the Eastern Health District studies contributed to methodology relating to this problem of identification?

A final question: What is the attitude of this "captive" population and what effect does this attitude have on the studies themselves?

Using the Hagerstown studies as a point of departure, Lawrence and Tibbitts have identified and thoughtfully commented upon several problems and numerous potentialities of long-term studies. There is a puzzling statement under the section on Method—Validity of Reporting: "A surprising and thus far unexplained finding of the comparative data is that 60 percent of the surviving persons reported as having chronic conditions in 1921 were reported as having no illness in 1943." Having said this, the authors in the following paragraphs adequately explain this fact. Furthermore, it appears that such a finding would not be so surprising under the circumstances of this 20-year study as described.

At this point it seems that a word of caution should be registered relative to the use of data obtained from such projects as the multiple screening examination or other similar service projects. They are set up primarily for service, the examinations are superficial, not diagnostic, and speed is the watchword. Great care should be exercised in the interpretation of quantitative data from these services.

The problem of the decline in population cohorts from year to year is a most critical one. What to do with cases lost by migration, death, or other reasons is of particular concern in therapeutic studies and in those studies relating to the risk of developing disease under one condition or other. This conference should explore this point carefully and set forth some guiding recommendations for use in other public health studies.

Is it possible to set up any permissible percentage of cases which may be lost without jeopardizing a study? Should these lost cases be dropped altogether, or dropped at the end of the last completed interval, or dropped midway of the next interval, or counted as both success and failure during the lost interval? This problem has been of particular importance in recent studies of penicillin-treated syphilitics. In spite of adequate reports to the contrary, most medical reporters in this field disregard lost cases altogether and base analyses upon the event observed in those followed for certain periods of time. Another point in this regard concerns returned cases. Does it matter whether or not returned cases are related to the event?

The problem of the interval between observations in long-term studies is another most important one. Very fre-

quently all we know is that the event we are interested in had not occurred at one known time and that it had occurred at another known time. What are the means available to obtain a close estimate of the actual time of occurrence during the unknown period?

Judging from the question posed in the portion of the Lawrence-Tibbitts paper devoted to the promise of longitudinal studies, it appears that long-term studies are "here to stay." In this short section alone there is complete justification for the present meeting. The three broad topics offered are indeed pertinent and point up the great number of unknowns in this field which offer a great challenge to us. Whether or not these questions can be answered with present methods should be discussed at length by this group.

We are left with many questions which lead to the old cliché, "There are many more questions than answers," but let us hope that after today, and the studies stimulated by these present discussions, this unfortunate gap will be considerably narrowed.

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Practical Aspects of Coördinating Maternity Care: The Role of Health Departments

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IN discussing coördination of maternity care and the role which health departments can play in accomplishing it, there are several general considerations which should be mentioned briefly before turning to any of the details. First of all, we seem to have an unfortunate tendency to use such terms as "coöperation," "coördination," "integration," and "overall concept" without giving a clearly understandable picture of what we are talking about. Often I wonder whether perhaps these terms are not being used to cover up lack of detailed knowledge. Accordingly, the basic purpose of my remarks today is to attempt to set forth some specific methods by which the word "coördination" can be made a reality.

A second general consideration is the value of establishing personal contact between individuals concerned in attaining "coördination." Taking the time and trouble to sit down and hear the other fellow's problems and point of view is important. Much of what follows is based upon the belief that the establishment of personal contacts is not only important but vital to the type of thing we are discussing.

Third, I should like to stress that the philosophy of health department activity in this field should not be on the basis of coercion, but of rendering advice and education, that is, not to force but to lead.

Today the average health department, particularly on the state or city level, is in a peculiarly favorable position to act as a coördinating agency. The everyday activities of health department personnel bring them into contact with an extremely wide variety of problems and people. In the morning a given health department worker may be concerned with a problem relating to a large teaching hospital. At noon he or she may be discussing mutual interests with a practising physician, and by 3:00 o'clock may be making a home visit with public health nurses in some remote community. As a result, such an individual acquires a reasonably accurate bird's-eye view of the problems, interests, and responsibilities of almost everyone concerned in any system of medical care.

With the foregoing as general background, let us turn now to a consideration of some of the practical steps by which health departments can promote

better professional care for maternity patients.

A logical starting point is that of bringing the large medical center into closer contact with patients and practising physicians. Too often, public health agencies and large hospitals work in the same community almost unknown to one another. Large teaching centers naturally concentrate on research, the instruction of students and house staff, and the care of such patients as happen to find their way within their doors. Often there is little comprehension on the hospital's part of the community health problems with which the health department is struggling. In turn, the health department is equally unaware of the problems facing the hospital.

The first step in obliterating this gap can be for a health department representative with the background for a full appreciation of the situation to approach the chief of the obstetrical department with a definite proposal for joint participation in a community-wide maternity program. The proposal could be as follows: Will the hospital obstetrical service be willing to accept a specified number of patients for care each year? Will the hospital give a qualified member of the health department staff access to the records of such patients and permission to visit them while they are in the hospital and to talk over various aspects of their care with the hospital staff? It can be pointed out that, if these patients are properly selected and accompanied by accurate records, they will form a valuable source of teaching material. This fact will undoubtedly appeal to the department head, since the scope of his teaching program depends on obtaining a wide variety of pathological conditions. In any event, there is no reason why, with a minimum of discussion and arrangements, a workable scheme cannot be evolved.

Arranging to have certain qualified and interested individuals hold positions concurrently on both the health department and hospital staffs will strengthen the plan and result in such persons no longer being outsiders to either department. They will be in a position to understand intimately the basic problems on both sides of the fence. Personal contacts are established which greatly facilitate smoothing out inevitable administrative difficulties. An arrangement of this type between the State Department of Health and one of the large teaching hospitals in Baltimore has been used successfully in Maryland for several years. It has enabled the health department to obtain expert obstetrical care for its patients and at the same time has furnished the hospital with a valuable source of complicated obstetrical material. Supplementing the plan has been the fact that the obstetrical consultant to the health department has at the same time held a position on the staff of the teaching hospital.

Our next approach should be directed toward the practising physician. Physicians, particularly in rural areas, have probably found their dealings with large medical centers impersonal and unsatisfactory. Too often they have difficulty arranging to have their patients accepted. Once admitted, such patients often are "lost" so far as the physician is concerned. The whole experience is apt to be frustrating and unpleasant. In this realm lies another golden opportunity for health departments. The plan proposed by the health department should include the admission of selected private patients of individual physicians. Provisions for seeing that the physician receives a complete report of diagnosis, treatment, and recommendations concerning his patients and that the patient is properly returned to him for further care must be included.

An ideal person to perform this function would be one of the previously mentioned individuals belonging to both the

hospital and health department staff. The amount of time required is small and the rewards are great. This relatively simple arrangement does more than hours of conversation or pages of written intentions to promote solid cordial relations between practising physician, medical center, and health department. It provides a daily example of coöperation and service.

There are additional ways to bring the physician and hospital together. Opportunity to attend hospital staff conferences, ward rounds, etc., can be arranged for the practitioner. When this is done, care should be taken to see that the physician is met upon his arrival at the hospital and introduced to the members of the hospital staff, instead of being left to wander around alone like a lost soul. He will be particularly interested in attending conferences concerning his own patients. This is informal postgraduate instruction in a highly effective form and preferable to formal lecture courses. The visiting physician, in addition to increasing his professional knowledge, finds that the hospital staff is actually made up of human beings after all, and not of horrible ogres who delight in saying, "Sorry, we haven't an empty bed." The hospital staff, in turn, learns much of the problems of physicians, particularly those from remote rural areas.

Another part of such a plan which works to advantage is to arrange to send senior or house staff obstetricians from large hospitals out into rural areas. The specialist takes with him his knowledge and experience, and at the same time he gains valuable insight into the many deficiencies existing in small communities. This latter point can hardly be overemphasized because one gains an entirely false concept of the practice of medicine in general and obstetrics in particular if one's entire experience is limited to the four walls of a large medical center.

For many areas, teaching centers are lacking or are too remotely situated to be of practical benefit. Our next concern, therefore, is with the smaller nonteaching hospital. This is often more difficult than the larger hospital, since facilities are frequently limited and the staff of the hospital may lack someone with adequate obstetrical knowledge. Step one is to determine what physician or physicians have a primary interest in obstetrics. He can be approached with a proposal that he furnish delivery care for health department patients. The proposition can be made attractive to him by offering to help with improving obstetrical facilities in the local hospital. The delivery room setup can be improved, advice on nursing technique and procedures obtained from the health department nursing staff, and facilities for blood transfusion and emergency consultation established.

Of particular value to the practitioner would be the presence of an adequately trained anesthetist and an adequate delivery room nursing staff. An attempt should be made to remove the physician from the unfortunate situation which exists too frequently, in which he is forced to carry out difficult obstetrical maneuvers without even a scrub nurse and with the anesthesia being given by an inexperienced person. He would certainly not be expected to undertake a major surgical procedure under such circumstances, and certainly major obstetrical procedures are no different. Soon it becomes clear to the physician that in return for devoting a small percentage of his time to indigent patients he is acquiring better facilities for the care of his own private patients.

An alternate method, and perhaps a preferable one, is for the health department to encourage qualified young obstetricians to settle in the smaller communities. In many instances, what keeps a young obstetrician from settling in a rural area is the fact that he has been

trained to have certain tools at his disposal. Among these are facilities for blood transfusion, x-ray pelvimetry, adequate nursing coverage, and the like. When these are lacking, he is apt to throw up his hands in horror and decide on a larger community with better hospitals. The health department can take a definite lead in pointing out the necessity for such adjuncts of maternity care and helping in their procurement. Once obtained, they open the way to drawing qualified obstetricians into the smaller communities.

A health department maternity program today *must* include the considerations described above if it is to meet the challenge presented. On the other hand, the example set by a well thought out, efficient system of prenatal clinics cannot be overlooked. The educational impact of such clinics can be profound, both on the patients and on local physicians. When health department clinics take the lead in such procedures as x-ray pelvimetry, routine chest films during pregnancy, routine Rh typing, and complete periodic examinations, they establish a standard of community care which sooner or later the local physicians must follow. Seeing that the local medical societies are kept informed concerning health department policies and facilities increases the scope of the program. By making available health department facilities to private patients, the value of prenatal clinics is greatly increased. Health department clinics can be developed into consultation centers and thus become an additional avenue through which an ever increasing number of patients can be served.

In fact, proving the value of consultation service seems to me to fall within the province of health department activities. There is a strange reluctance on the part of private physicians, particularly in smaller communities, to avail themselves of advice from their confreres. Whatever the reason, the fact remains that this unwillingness to accept consultation is a barrier to better obstetrical practice and is something that must be eliminated. Health departments, with their far-reaching facilities, should undertake to furnish as much consultation service to physicians as possible. Acceptance of such service, however, cannot be forced upon physicians and will undoubtedly be slow and gradual.

There remain a number of important parts of a community maternity program still to be discussed. There is the matter of supervision and control of midwives. In many areas of this country, the midwife is a fast disappearing commodity. None the less, such midwives as do remain must be kept abreast of current obstetrical technique, and this task logically falls to the lot of health departments. Here is one instance in which, in my opinion, a certain amount of force becomes necessary. The health department should undertake to obtain, if it does not already have it, the legal right to license, examine, inspect, and supervise the activities of midwives. Specific regulations should include one that midwives may accept for care only such patients as have been determined by a physician to be entirely normal. They should not be allowed to perform anything but the simplest normal obstetrical procedures. Under a supervised regime, the results to mother and child in the hands of the midwife should be excellent, provided adequate professional consultation is available in emergencies.

Always in the background when one is dealing with indigent patients is the shadow of finances. If sound relations have been established between health department and hospitals, some scheme can be evolved to suit each individual economic problem. Through funds available to the hospitals, health departments, welfare agencies, volunteer sources, or insurance plans, plus what the patients themselves can contribute, some satis-

factory financial plan should be available. Finding the solution to financial problems may take considerable tact and effort on the part of some member of the health department staff.

Recent years have seen a tremendous growth in the scope of activities of most health departments. The task of maintaining liaison between the various subdivisions of a large health department is beginning to assume considerable magnitude. The health department division responsible for the maternity program must keep in close contact with the nursing staff, the nutritionists, the laboratory division, medical social workers, and all other departments that help so much toward making a coördinated effort possible. To this end, frequent informal conferences to discuss mutual spheres of interest should not be difficult to arrange.

Medical schools, by and large, have done little toward interesting medical students and young doctors in problems such as we have been discussing. Health departments can help to correct this deficiency by furnishing medical students and members of hospital house staffs with an opportunity to see something of the practice of medicine outside of our larger centers of learning. All that is needed is one or more individuals with the time and interest to arrange a schedule of informal field trips. Such activities for students would seem to me to be good insurance for the future of health departments and medicine in this country. We need a generation of young doctors interested in this phase of medicine. If properly indoctrinated, they may do much toward correcting the maldistribution of physicians existing today.

Many communities have established maternal mortality committees. In those areas lacking such a committee, health departments have an opportunity to render a great service by stimulating their formation. The establishment of a maternal mortality committee is not difficult and simply requires initiation.

In summary, I have tried to indicate that there are certain practical steps which can be taken by health departments today to produce a real and working coördination in maternity care. The real basis for establishing such coördination is the presence of one or more individuals with the proper background and with sufficient time and interest to see that personal contacts are established and that the little things that mean so much are not neglected. The horizon of health department participation in a community maternity program extends far beyond the mere establishment of a prenatal clinic system and home visiting nursing service. We must include hospitals of all types, the practising physician and his private patients, the acceptance of consultation service, more intimate relations between teaching hospitals and smaller hospitals, the addition of informal personalized postgraduate education, and an attempt to interest medical students and young physicians in these problems. With the realization that this is the minimum for a maternity program worthy to be called such will come a vast improvement in the standards of maternity care everywhere. And finally, I should like to add what is undoubtedly obvious to all of you, that there is no need to assume that this approach should be limited to maternity work only. On the contrary, the pattern would seem to be equally applicable to all of the many subdivisions of medical care.

Coördinating Maternity Care: The Role of Nursing

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PUBLIC health nursing for several years tended to separate itself from its alma mater, the hospital, and from voluntary nursing agencies. Recently there has begun not only a decided swing in reverse, but there has come the realization that the department of public health—of which nursing is a part—can be a coördinating agency. Particularly is this true for better maternity care.

Public health nursing is now being integrated into the basic curriculum of the hospital nursing school. Public health nurses are working with the nurse in the maternity wards and outpatient departments to tie in the home and community with the hospital, and public health consultants are helping the hospital solve its obstetrical problems. This integration will mean that patients, particularly prenatal patients, will be viewed as family and community members—socially, emotionally, and physically—rather than simply as a gravid uterus walking around on two legs.

What has public health done as a coördinating agency with the voluntary agencies? A brief description of a joint public health and Red Cross program for teaching parents' classes shows how coöperation enabled both agencies to reach many more persons than either could have reached alone. In an area of rural and industrial population, with limited hospital and medical services, the Red Cross Chapters were geared only for wartime work and occasional participation in special community endeavors. Groups were not being reached by public health because of the feeling that public health services were only for the colored and the indigent. Recognition of the problems by both groups was the first step toward solving them. After this recognition and the decision to work together to solve it, operations proceeded quickly. A detailed preplanning was done at the state level by the two agencies; organization for a nurses' workshop and the parents' classes on a regional level by both agencies. The actual giving of the classes by the public health nurse was carried out with the full coöperation and active support of her local Red Cross Chapter.

The workshop for the nurses lasted a week. State, regional, and county nurses from both agencies sat down together with Unit II Red Cross Mother and Baby Care and Family Health as a guide, and planned for their classes on a local level. Immediately afterward, each public health nurse began teaching a group in her community and after one series of classes had been completed, an evaluation was made by the regional and state staff of both agencies. There is no way to measure entirely the results of this harmonious working together of personnel, but Red Cross Chapter organization and public health community interest were strengthened to such a degree that in another area of that same state plans are being made to continue the joint program this fall.

In many southern states, as the num-

ber of babies delivered continues to increase, the personnel to do the deliveries diminishes. The untrained midwife is not only decreasing, but she is a much older person, with tottering legs, shaking hands, poor eyesight, and defective hearing. A study made in one state this year showed that of its 1,500 midwives, 1,000 of them are from 50 to 70 years of age, almost 300 are over 70, and only 216 are less than 50 years old. The doctors of that area, for socio-economic reasons and because of greater opportunities for specialization in cities, are congregating more and more in urban areas. That particular state will face an obstetrical crisis within the next fifteen years unless preventive measures are taken to fill the "obstetrical gap." That is, until an adequate number of doctors can be provided to care for the prospective mothers and babies.

It is in anticipation of this probable crisis that two county demonstrations using nurse-midwives have been set up to test the effectiveness of having nurse-midwives on the county health department staff to do deliveries. To obtain the best blueprint for future work, one experiment was set up to make deliveries in the local county hospital, the other delivers the woman at home.

1. The doctors like the service in both counties.
2. The number of deliveries by local untrained midwives is decreasing.
3. There is no antagonism between the nurse-midwife and the local midwife.
4. With the nurse-midwife service connected with the county hospital, the number of deliveries in the hospital increased over previous years.
5. There have been earlier registrations in pregnancy. In 1945, before the services began, 53 per cent registered before the seventh month. In 1948, 62 per cent registered earlier than the seventh month.
6. The average number of clinic visits per prenatal has increased from 3.54 in 1946 to 7.24 in 1948.

Both demonstrations have given "customer satisfaction," since women in each area are now having their second and third babies delivered by the nurse-midwife. The first delivery in one county was the daughter of one of the local midwives.

Perhaps some of the reasons the local midwives are not antagonistic are that they are not "undersold." Actually, they feel more secure about their own patients, since the nurse-midwife helps with the prenatal care of the local midwife's patients in the maternity clinics. The nurse-midwife collects the same fee that the untrained midwife charges. In the hospital type of delivery, this pays for three days of hospitalization, with the only additional charge $1.50–$2.50 for ambulance transportation. In the home type of delivery, the fee is turned in to the county treasury, where it is used in the event of hospitalization.

The private physicians are receiving service in the hospital type of delivery, since a nurse-midwife attends his patients in labor and assists him during the delivery. This gives the physician more hours in the office, at home, or in sleep. He in turn gives his consultation and services free in the event something abnormal occurs during the labor or delivery of a nurse-midwife patient. In one instance, a patient with a Caesarean had the free services of three physicians and additional free days at the hospital.

The nurse-midwife works under standing orders approved by the state and local medical societies, and is under the supervision of her county health officer and supervising public health nurse.

The final authorization as to whether a patient is in sufficient physical fitness or of insufficient economic status to use the services of the nurse-midwife rests with the family physician, although the welfare agency in one county investigates and reports the economic standing.

The hospital nurse-midwife delivery service illustrates particularly well a gain in maternity care through coördination, since the private physician, hos-

pital staff, public health staff, welfare agency, and local midwives work together to give better hospital maternal care for the less economically favored mother.

These two examples of parents' classes and nurse-midwife service coöperation show pioneering in a new venture, with the department of public health as the coördinating agency. They are but little past the birthing process. We do not say they are the answers. We do strive for better coördinated maternity care for our prospective mothers.

Coördinating Maternity Care: The Role of Nutrition

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RESEARCH studies of the past decade have demonstrated that the nutrition of the pregnant woman is of primary importance. The Oriental concept that the baby is already nine months old at birth must be taken seriously when we consider the effects of nutrition on the human organism.

A leader in the field of nutrition education research recently said, "Nutrition education is the *retail end* of nutrition research." It is of vital importance for all who are interested in the health of the baby and his mother, therefore, to consider the ways and means whereby scientific knowledge can be translated into plans for action.

In a program of maternity care, nutritionists and nurses work as members of a team with the obstetrician. I should like, therefore, to speak about functions of the nutritionist as a member of this team.

What specific help can the trained nutritionist offer?

1. The nutritionist, because she is trained in a specific field, has the opportunity of supplementing the knowledge of the physician and the nurse. Members of these professions, who must be aware of all the recent research in their own field, usually do not have the time to keep up with all the newer findings in nutrition. In addition, the scientific journals which the physician and nurse read do not present many of the research studies which may have real bearing on proper feeding. For instance, many articles on the loss of nutrients during the cookery processes are carried in journals on food and nutrition.
2. A nutritionist is trained not only in the science of nutrition: she must also understand how to plan and prepare meals. She may offer a program of maternity care of definite help in this area. More frequently than not, the woman who must change her mode of eating needs specific help in how to keep the protein, minerals, and vitamins high while she is reducing the calories in her diet. We have found in our own program that the help which we furnish in giving the women specific directions on how to plan their meals and how to prepare their foods often represents the most vital part of the diet instructions.

It cannot be too strongly emphasized that people drink milk and eat meat, vegetables, and fruits. Only as we translate the terms calories, protein, calcium, etc., into terms of actual foods to be eaten do we make nutrition knowledge functional. This the nutritionist, by training and experience, is able to do.

What problems do nutritionists interested in prenatal diet face?

First: The nutritional problems of pregnancy are superimposed upon cultural and family food patterns. In addition, the economic situation of the family, food prejudices, food likes and dislikes further complicate the problem.

Second: Consideration must also be given to the fact that in the usual course of events, when the physician first sees the woman, she has often passed through at least two or possibly three months of her pregnancy. Therefore, changes in diet, if there be need for change, must be made rapidly if they are to be effective.

Third: As yet we have inadequate knowledge of the effect of pregnancy on

hunger or appetite. There is great need for research studies in this area.

Fourth: All of us who deal with pregnant women are aware that their emotional reactions to food are highly colored by their reactions to the reality of being pregnant.

PROGRAM PLANNING

Well planned and well coördinated programs do not spring into being full blown. How then can a nutritionist show the need for her services in a coordinated program for maternity care?

It has been well proved in many fields that a demonstration of need can best be presented by a survey of existing conditions. May I illustrate by telling you how this method was applied in a specific community? In 1946, when the community nutrition program was being planned in Rochester, Minn., it soon became apparent that we did not really know what pregnant women in our community were eating. During the early months of this program, a nutritionist conducted a diet survey on 162 pregnant women. Pregnant women in this community receive their care either in a maternity clinic or as private patients of an obstetrician. Our survey group was divided so that 50 per cent of the cases would represent each of these groups.

The results of this survey interested the obstetricians as well as the staff of the Public Health Department. We found:

1. That there was real need for a dietary service in the maternity care program. Only 71 per cent of the women were taking adequate protein and only 26 per cent were taking as much as 400 units of vitamin D. The percentage of adequacy of the needed minerals and vitamins varied from 64 to 39 per cent.
2. That approximately the same number of women who were patients of private physicians as those who were maternity clinic patients had inadequate diets.
3. That a smaller number of women whose husbands were in the professional or skilled trade classifications had adequate diets than the women whose husbands were farmers or in the unskilled trades. There were, however, more poor diets in the lower socio-economic groups. We therefore found that although the adequacy of the income did affect the kind of diet, it did not insure the pregnant woman of having an adequate diet.

With the impetus of seeing clearly that pregnant women in Rochester needed more help in nutrition, we have set up a program. Since we fortunately had a public health officer and a supervisor of public health nurses who realized the importance of nutrition, the public health department was extremely anxious to add dietary supervision of the patients to its program of maternity care. One nutritionist, who was loaned by the Rochester Child Health Institute to this department for a part of her time, was asked to give consultation service.

A COMMUNITY PROGRAM OF DIETARY SUPERVISION

This nutritionist and the members of the staff of the public health department began experimenting with a program of inservice training of the public health nurses so that they could give the actual instructions in nutrition to the patients. A so-called diet team was organized. This team consisted of a public health nurse and a student dietitian from a local hospital training course. A nurse served on this diet team for a period of two to three months, giving two half days a week to this program. (Two maternity clinics per week are held by this health department.)

As a nurse came new to this service, she first sat with the nutritionist or the supervisor of public health nursing, observing the instruction of the patient. Later the nurse took the leadership in conducting the diet interview and the nutritionist sat beside her to give her help or guidance as she needed it. When the nurse herself felt that she was ready to take on this duty alone she did so.

A series of staff meetings were also

conducted by the nutritionists. In these the nurses discussed with the nutritionist their most pressing problems.

Each new maternity patient visited the diet table at the time of her first visit to the clinic and as often thereafter as it was felt necessary to keep her on an adequate diet. Two years experience in critically evaluating this program revealed several weaknesses which obviously needed correcting. These were:

First: There was a tendency to place too much emphasis on weight control and not enough on the need for an adequate diet.

Second: For some women, emotional tensions were increased because they were asked to see the diet team frequently.

The public health nursing staff decided to try a diet class where the women could meet in groups. We all believe that in a group a woman may feel less tense because she learns at first hand that other women also have problems. During a trial period of group instructions we learned several things:

1. A special kind of skill is required to handle groups. A well trained public health nurse or a well trained nutritionist does not necessarily have this ability. It was decided that more training in the techniques of group methods than was possible at the moment was needed to hold successful group meetings. The plan of group meetings was therefore temporarily abandoned, although we intend to try to perfect this method and use it at a later stage.
2. It was also felt that when a woman was with a number of people in such a situation she did not have the opportunity to talk out her individual problems with one person in whom she felt confidence.

We are now trying a different type of dietary service in these maternity clinics. Each maternity patient at the time of her second visit to the clinic will be seen at the diet table. (She will then have had one visit to become oriented to the clinic services.) At this time, emphasis will be given to the need for an adequate diet. At each subsequent visit to the clinic, the regular interviewing nurse and not the diet nurse will follow through with further help in nutrition as the woman needs it. This plan, we hope, will place the emphasis on the need for an adequate diet and not undue emphasis on restriction of calories. It will also give each woman the opportunity, after her first diet interview, to discuss her own personal problems with one person alone.

A new public health center in which there is a modern demonstration kitchen has recently been completed. At the present time, there are two nutritionists. These nutritionists are using this kitchen to give group demonstrations to maternity patients. Through these demonstrations, specific help can be given in menu planning and in food preparation. For instance, the woman who does not like to drink milk will see demonstrations and taste the products in which a dried milk powder is used in cooking. We also hope to hold group discussions where, over the informality of discussing the cooking of actual food, women may begin to discuss their own specific problems.

May I emphasize that in working through all of this program the nutritionists have found the public health nurses very much interested in giving instructions in nutrition and fully capable of doing this. Many nurses have expressed the idea to us that for the first time in their careers they really like nutrition. They have also said that this inservice training in the maternity service has increased the effectiveness of their nutrition teaching in other areas. There has always been a waiting list of nurses who have requested the opportunity to serve on the diet service.

Nutrition in the Rochester-Olmsted County Health Department is now felt to be a joint responsibility of the entire staff. We discuss our common problems quite openly and freely at the public

health department staff meetings and seminars. The public health officer, the nurses, the mental hygiene consultant, the health educator, and social workers are as vitally interested in the activities of the new demonstration kitchens as are the nutritionists. We believe that nutrition is vastly stronger because it is the responsibility of a team.

We expect that the activities of the demonstration kitchen will be used to illustrate graphically to the obstetricians, both on the staff and in training, the value of the nutritionist's team in securing an adequate diet during pregnancy.

Another part of the program of nutrition in maternity care in Rochester should be discussed. The obstetricians who see private patients in the Mayo Clinic, observing the help that nutritionists were able to give to maternity clinic patients, requested the services of a nutritionist. For the past two years, the nutritionists of the Rochester Child Health Institute have spent two half days a week in this service. Patients are referred to us directly by the obstetricians and are seen in the clinic. In all these interviews we try to find out what the woman is eating, how she feels about the diet we are hoping she will follow, and what her specific problems are. We believe the most effective part of this program is the help we are able to give to these women in methods of preparation of foods and in menu planning. If a woman is instructed to follow a 2,000 or 1,800 calorie diet, for instance, we make a plan with her for the day's diet, scheduling the foods needed at the time of day when they are most acceptable to her. The plan of trying to control the woman's hunger on a 5 or 6 meal a day basis has proved effective. Not all the women are able to stay on the diets; however, a recent examination of the records of 50 cases shows an encouraging number of case histories which read like the following:

Mrs. C. saw the nutritionist during her sixth month of pregnancy. She had gained 7 lb. the previous month, and a total of 15 lb. over her prepregnant weight. The nutritionist, in going into her dietary practices, discovered that she had not realized how many extra calories she was getting by tasting while she cooked. She was instructed in a 1,800–2,000 calorie diet and was asked to write down everything she ate during the day and to score her own diet for 3 days. She was able to hold her gain for the remaining 4 months to 7 lb.

Another patient, Mrs. M., was seen by a nutritionist during her eighth month of pregnancy. Before that time, she had been given diet instructions by the obstetrician. She had gained 22 lb. over her prepregnant weight. When the nutritionist saw her, her diet was still too high in carbohydrate foods and she gave a history of taking no food before noon and of eating almost steadily from noon until bedtime. She ate fried foods, candy, and desserts frequently. She was instructed in a 2,000 calorie diet. A plan agreeable to her for 5–6 meals a day was worked out. She agreed to try to drink more milk and to eat less desserts and fried foods. She was able to control her hunger and held her further gain to 2 lb. This case has been chosen not because it represents an ideal situation but because it does illustrate the type of help a nutritionist can give. Undoubtedly it would have been wise to have worked with this woman earlier in her pregnancy had she come sooner.

In these cases, as with all young women of childbearing age, we must think of what we can do to instruct them better for their next pregnancy. We have as yet done little in nutrition in the field of interpartum care. We are also of the opinion that serious consideration should be given to education in nutrition for young married women before they begin to have their families. Only in that way can nutrition advice really affect the growing embryo and

fetus during the entire growth period.

I am sure we all agree that the emphasis in nutrition instruction during pregnancy should be directed toward helping a woman take an adequate diet and not toward control of weight alone. It has been our experience as nutritionists that there is in reality little disagreement between these two purposes. The women who gain weight too rapidly are usually not taking what are considered adequate diets: their diets are often low in protein and too high in carbohydrate and fats.

We have worked out some techniques which have proved helpful to us in counseling either private or maternity clinic patients. Very early in our program of diet instruction, we met the necessity of having a method for rapid evaluation of the woman's diet. We therefore devised what we have called *Score Your Diet*. The idea of this booklet was to give to the patient a device whereby she herself could evaluate her own diet after we had shown her how to do it.

It will be seen from Table 1 that we have translated the measurements of all of the food nutrients to units. The other pages of this booklet list food values for fruits, vegetables, desserts, fats, and cereals. This has the advantage of not confusing the woman with grams, milligrams, or decimals. We also use this device to show the comparative values of different foods. When there is time during an interview, we ask the woman what she ate the day before, correcting for variations from her usual diet. The number of servings of each food is then underlined, and we quickly add up the units of protein, calcium, iron and so on which she received. If, for instance, she had 650 units of protein, we show her that she needed 850. By going back over her diet, we can show her that two more glasses of milk and one egg would have added 235 units of protein, bringing her diet to adequacy. We try to explain to her why she needs protein. We use many similes in doing this, pointing out, for example, that protein acts as actual building material for the formation of her baby's body. We often say that to build a strong brick house we all know we must have enough good bricks.

The problem of the dislike of foods such as milk often arises. Many times the woman who is not drinking milk because she does not like it tells us that she is taking calcium tablets. We have an excellent chance with this booklet to show her that the contribution which milk makes to the total protein and riboflavin is also important.

Oftentimes in seeing patients we find that we can take only 30 minutes with each one. In so short an interview we do not have time to evaluate and correct one day's diet. It has seemed a better use of this time simply to go over each item of the diet, writing in *Score Your Diet*, which the patient will take home with her. We begin with the question, "Are you drinking one quart of milk?" If she says, "No," we ask first, "Could you?" The answer now is often, "I don't like milk, but I could drink a quart if I really make up my mind to." We explain that it is far easier to make up an adequate diet with a quart of milk. If, however, the woman cannot drink milk, we show her how much protein may be supplied by meat and eggs and where she can get the other needed nutrients. Usually the doctor has already advised her to take calcium tablets.

We discuss each item in the diet, showing how calories can be decreased by taking out some fat and carbohydrate from her diet. At this point we must give her rather detailed instructions in how to cook her foods.

One of the problems which we often encounter as we talk to pregnant women is the real hunger which some of them experience beginning the fourth and fifth month. We try to get the women to see

TABLE 1

A Sample Page from Score Your Diet

Food	*Size of serving*	*Servings*	*Calories*	*Units*							
				Protein	*Calcium*	*Iron*	*Vitamin A*	*Ascorbic Acid*	*Thiamin*	*Riboflavin*	*Niacin*
PROTEINS											
Milk											
Whole	1 measuring cup or 8 oz.	1	160	85	28	5	410	2	10	43	3
		2	320	170	56	10	820	4	20	86	6
		3	480	255	84	15	1,230	6	30	129	9
		4	640	340	112	20	1,640	8	40	172	12
Skimmed	1 cup or 8 oz.	1	90	85	29	7	25	2	11	43	2
		2	180	170	58	14	50	4	22	86	4
		3	270	255	87	21	75	6	33	129	6
		4	360	340	116	28	100	8	44	172	8
Meat											
Veal, beef, fowl, lamb	1 medium serving	1	160	180	1	31	20	——	9	15	39
	(5–6 servings per lb.)	2	320	360	2	62	40	——	18	30	78
Liver	1 small serving	1	80	120	1	49	16,500	9	12	122	60
	(7 servings per lb.)	2	160	240	2	98	33,000	18	24	244	120
Pork	1 medium serving	1	205	180	1	24	——	——	60	15	32
	(5–6 servings per lb.)	2	410	360	2	48	——	——	120	30	64
Luncheon meat (cooked)	2 slices minced ham	1	80	50	——	7	——	——	9	7	8
	or luncheon meat or	2	160	100	——	14	——	——	18	14	16
	½ frankfurter	3	240	150	——	21	——	——	27	21	24
		4	320	200	——	28	——	——	36	28	32

Note—Copyrighted by: Rochester Child Health Institute, 1947.

that this hunger cannot be denied but must be satisfied by the right kind of food. We have found one solution to this problem in the institution of the 5 or 6 meals a day plan. Suppose we decide that a particular woman can maintain a desirable weight gain on 1,800 calories a day. We begin by asking her what she wants for breakfast. If, for instance, she says that she usually eats fruit, cereal, and toast, we write this breakfast down, counting the calories in it for her. Then we ask her if she wants food at 10 a.m. We may urge her, if needs be, to take a glass of milk with fruit at this time. Next we proceed to the lunch, the afternoon snack, and to the dinner. We use the idea of budgeting the 1,800 calories through the 5 meals. When we finish, we check with her to see that we have included all the necessary foods. If the woman does not want an egg, we use *Score Your Diet* to help her find an adequate substitute. As we go through this process, we teach the woman to "buy" protein, calcium, etc., with calories. For example, we say to her, "One-half cup of carrots 'costs' you 30 calories. From this portion of carrots you get some of the needed iron and 9,000 units of vitamin A. Whereas from one-half cup of corn, which costs you 95 calories, you would get 75 units of vitamin A."

SUMMARY

May I summarize briefly what I believe the role of nutrition is in coördinated maternity care:

First: To bring to the entire program and to the different members of the team giving maternity care the recent findings in the field of nutrition. To sell the idea of the importance of nutrition may be the first step in this process.

Second: To translate the result of nutrition research into practical day by day procedures to make it possible for pregnant women to eat adequate diets *happily*.

Third: To make the methods of teaching nutrition practical and applicable to specific situations. Then, as we explain these methods to obstetricians and nurses, they also can constantly teach nutrition to their patients. Only as a nutritionist spreads her teaching so that all members of the team tell the same story can a really effective job be done. In this process the nutritionist, too, can learn much from the other members of the team.

THIRD GENERAL SESSION: SOCIAL AND ECONOMIC PROBLEMS OF MATERNITY CARE

Honorary Chairman: SIR EARDLEY LANCELOT HOLLAND, London Hospital, London, England

Chairman: EDWIN F. DAILY, M.D., Children's Bureau, Federal Security Agency, Washington, D. C.

Maternity Care in Sweden from the Medical and Social Point of View

BIRGER LUNDQUIST, M.D.

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MATERNITY care in Sweden has for 300 years been the interest and responsibility of the State. In 1663 a regulation was issued prescribing certain qualifications for women who devoted themselves professionally to midwifery. In 1700 a complete system of teaching was started involving theoretical as well as practical training, and in 1723 the State assumed the responsibility and the costs of that education. In the course of time the education of midwives has been greatly expanded and has given our country a corps of skillful midwives.

Quite naturally the deliveries, earlier, always took place in the homes. In 1900, with a total number of 135,000 deliveries in the country, only some few thousand deliveries—approximately 5 per cent—were in hospitals, viz., in hospitals for the training of medical students and midwives. In time a slight trend appeared toward hospital deliveries which was accentuated after 1920, and today the situation is the opposite of that of thirty years ago: 10 per cent home deliveries and 90 per cent hospital deliveries.

It may be worth mentioning that of the hospital deliveries, 40 per cent are done at special maternity clinics with a specialist in obstetrics as the head of the clinic. About 45 per cent are confined to maternity wards in general hospitals having no obstetric specialist.

Five per cent are delivered in small maternity homes and 10 per cent at home.

In the same manner, as midwives earlier attended patients in their homes, they now professionally handle them in the hospitals. Doctors do not assist at deliveries except in cases of complication and then the midwife will send for the doctor.

The results of our maternity care are to be had from official statistics which are available since 1780. The maternal mortality during the period 1861 to 1880 was 5.5 per 1,000 pregnant women, including abortions. After Semmelweiss's discovery on the nature of the puerperal septicemia, the mortality rate diminished. The maternal mortality since 1885 was lowered from 5.5 to 2.75 in the 1890's and at that level it remained, strange to say, for the next thirty years. After having been rather constant up to 1925, there was a clear

rise apparently coinciding with a lowering of the birth rate that reached the bottom in 1934. This increase in the maternal mortality has two main causes. One is that in times of low birth rate there is always a relatively larger number of primiparas, which in itself implies a higher mortality rate. The other cause is the fact that at that period the number of infected abortions was higher than earlier.

As mentioned, it was strange that the maternal mortality rate did not diminish, although it could have been expected to do so in view of the fact that the general mortality rate was clearly descending. However, during the past ten years there has been a considerable decrease. In 1946 the figure was 0.95.

The three main causes of death are: first, toxemias; second, puerperal and postabortal infections; and third, "other diseases," which predominantly are hemorrhages. There is a slight decrease in the death rate from toxemias and hemorrhages, while the death rate from infections presents a marked lowering.

The rapid decline of the mortality curve has occurred simultaneously with the sharp incline of the hospitalization curve. The hospital care is certainly one cause of the lowering of the maternal mortality. Another explanation includes the use of modern medications, sulfa, and antibiotics. Moreover, an important factor is to be found in the fact that we have pursued for nearly fifteen years an extensive antenatal program which is now beginning to show results.

The antenatal care program was initiated in 1938. It works, in towns, through maternity welfare centers of two types. One is conducted in obstetrical clinics and is directed by an obstetrician; the second type is connected to general hospitals and is led by a surgeon.

In heavily populated areas the antenatal care covers 100 per cent of the expectant mothers.

Sweden is, in a geographic sense, a rather large country, but the population is sparse in many rural districts. Over such districts are spread maternity welfare stations at places where local medical officers are stationed. Maternity welfare branches farther out in the country are attended by a visiting medical officer. Under these circumstances it can be readily understood that the antenatal care in many rural districts cannot be compared with that found in the more populous localities. The antenatal care is used by more than 60 per cent of the prospective mothers in the whole country.

The stillbirth rate has been rather constant during the past fifty years, approximately 25 per 1,000. During the last half-decade, there was a rate with a descending trend in 1947 of 21 per 1,000.

For the year 1947 there is a statistical figure available concerning the neonatal death rate. But with regard to the many uncertain conditions involved in procuring this neonatal value, it is not fully trustworthy. The figure is 11 per 1,000 new-born, but in reality the number might be somewhat higher. However, more reliable statistics give the figure 16 for 1944.

With the growing appreciation of the importance of maternal welfare in relation to the population problem, the State has been giving increasing concern to providing facilities for adequate medical attention to the mother. In addition to this, the cost incurred in childbirth is often a financial burden to the family. The authorities of the State have felt that the cost of childbirth should not be borne by the individual, rather that it be distributed among all citizens.

As for the facilities for adequate medical care, there are hospitals of different types run by towns and county councils, and some for medical education by the State. In the larger cities there are obstetric departments at the

general hospitals conducted by obstetricians. In most of the county areas there is in the principal town of the area an obstetric department at the general hospital, also headed by an obstetrician. This institution is not yet to be found in all county areas, but it is planned over the next few years. For the rest of each county area there are general hospitals with maternity wards having no obstetrician. These hospitals were primarily not intended for normal deliveries but, during the short time of three decades since they have been extended, they are now open to all pregnant women. Besides, there are in sparsely populated areas maternity homes under the supervision of the local medical officer. Private maternity hospitals or "homes" no longer exist.

The State assumes responsibility for the education of doctors and midwives.

Regarding the economic facilities, it is to be said that, generally speaking, since 1938 the care of maternity patients is free. The antenatal care is free. The patient can receive, according to her needs, prophylactic drugs and therapeutic agents at no cost. In rural districts free transportation facilities are provided for women to travel in groups to welfare centers and stations or branches.

The pregnant woman has the choice to decide for herself whether she wishes to give birth to her child at home or in a hospital.

If the birth takes place in the home, the pregnant woman is afforded free attendance by a visiting midwife. She receives free treatment including nitrous-oxide gas, draping materials, and medicines required during labor and in the postpartum period. The traveling expenses of the midwife are paid by the community. In the case of complicated labor, demanding the attendance of a doctor, the cost is paid by the patient.

The care in a maternity hospital is also free of charge. However, the patient has to pay for the food 1:— Swedish Crown per day, which is approximately 20 cents. Institutional care, draping materials, and the medicines are free of charge.

In addition to these benefits there are several types of financial aids. A woman who is a member of one of the approved insurance companies, which are subsidized by the State, receives at her confinement a certain sum from the company. A patient who is not insured against sickness can get a certain economic aid from the State, provided her application exhibits evidence that she has need of economic help.

About 90 per cent of the pregnant women have the benefit of one of these two forms of relief.

There is, moreover, a third form of economic aid. It is granted by the State in cases where the application indicates evidence that the two forms of benefit just mentioned are insufficient. As a rule it is paid for essential equipment needed, such as making available free cribs, supplemental food, dental hygiene, and so forth.

There are also other types of maternity relief services, such as social domestic help, *et al.*

The burden of the expenses of the maternity relief work is shared by the State, the counties, and the cities. Proportionally this cost, relative to the hospital maternity care, amounts to 10 per cent for the State and 90 per cent for the counties and cities. In home maternity care, the State pays 50 per cent.

The amount of money spent on the maternity relief work is fairly large but it seems to be for a good cause. The birth of a child in Sweden relieves the mother of any anxiety over the best possible medical care and over financial obligations.

Discussion

RUTH G. TAYLOR, R.N.

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ONE of the vital forces in the evolution of Sweden's health services has been the mutual concern of the State and the citizen in the development of social policy. As a nurse concerned with public health, I have been interested in Sweden's maternity care program for many years. Last fall I had the privilege of seeing it at first hand.

As Dr. Lundquist has told you, his country began to plan a nation-wide program of care for all maternity patients 300 years ago with the initiation of midwifery training and the provision of midwifery services. In practical, realistic fashion, Sweden's health program has been directed to meet the most immediate needs of the people. But at the same time, as each new service was developed it has been fitted into an ever enlarging pattern of comprehensive care.

We might well consider for a moment the amazing accomplishment in the present provisions of the maternity program as a goal for other countries where action on a national scale is in progress or where such action is being seriously considered.

Scope of service offered—Gradually the service of the midwife for mothers in their own homes has been replaced by hospital care. Ninety per cent of all maternity patients now have access to medical consultation and facilities for the treatment of emergency or abnormal conditions of pregnancy. Through services of district physicians supported by the national government, every woman who chooses to be delivered in her home knows that if the attendant midwife needs help, medical care may be made available.

Many of us who have struggled to bring services to distant settlements and isolated farms envy a country like Sweden, which provides regular transportation to the doctor's office or to classes for the antenatal patient. Other measures for safeguarding the health of mothers include inexpensive housing, free vacation travel, and a home helper to replace the mother during hospitalization, when on a holiday, or when she has to be out of her home for any reason during the postnatal period. The nation's concern with the social and environmental factors affecting the health and welfare of maternity patients has been reflected in the provisions for adequate food for pregnant women and the right of women in industry to maternity leave before and after the birth of their babies.

Quality of service safeguarded—As the amount and scope of service have been increased and facilities for care expanded, quality has been consistently safeguarded and improved by more intensive and liberal distribution of specialized personnel in Sweden. Qualified obstetricians are available for direct services to mothers in the clinics and in hospitals in urban centers. They are also available for consultation to district medical officers and for care of patients with abnormal conditions. The State school of midwifery, which Dr. Lundquist directs, accepts only nurses for this special training; a second such school in Sweden will also carry out the same practice within five years. Eighteen months of concentrated instruction in midwifery and practice under close supervision develops competence and skill in the area of maternity and early infancy care—a competence and skill

not achieved by nurses in the United States or in other countries with which I am familiar through the present systems of nursing education.

Regional organization of hospitals with a central general hospital, smaller general hospitals, local hospitals, and maternity homes is an old, established pattern in Sweden. One point in particular is of interest to us in considering this phase of the service—that is, the role of the citizens' councils of the various political subdivisions in meeting the health needs of mothers and preschool children. These councils are concerned with the expansion and improvement of facilities provided through taxation, according to a plan developed jointly between county health and governmental authorities. The principle of consumer participation is carried out, from the declaration of policy in the parliament to the acceptance of the patient's decision regarding the type of care which she desires, whether she be the wife of a reindeer herder in Lapland or the wife of a prosperous merchant in Stockholm.

One phrase in Marquis Child's report on social developments in Sweden has been quoted extensively in the United States. He said, "Sweden is not concerned with short cuts to Utopia." This has certainly been true in the field of maternity care. Sweden has concentrated on progressive steps toward the goal of good maternity care for every mother. Much progress has been made. But there are still problems to be faced. A recent analysis of the total health and welfare program in Sweden frankly states that the most troublesome problems are (1) a general and continuous shortage of personnel, and (2) the fact that the social and psychological aspects of medicine have been underemphasized in the training of Swedish doctors and nurses. This lack is clearly shown by the dearth of social case workers as teachers and consultants in programs of medical and nursing education or service.

There is much that we can learn from Sweden's experiences in bringing good maternity care to every pregnant woman. Sweden has clearly recognized the need for expanding the scope and improving the quality of care given by the midwife as the first step toward better maternity care for all mothers. Sweden has recognized a need for a broader area of influence for the nurse-midwife by giving her a recognized function in normal obstetrics in the home or the hospital, and by planning for the integration of the training of the public health nurse and nurse-midwife. This latter objective has two purposes which have also been recognized by Finland, the United States, and certain South American countries:

1. That more economic and efficient administration of public health nursing and midwifery in very rural areas can be carried out by combining these skills in one person, who can be assigned to a number of villages.
2. That a public health nurse with a background of training such as that given in nurse midwifery is in a position to influence widely the quality of maternity nursing in her capacity as teacher, consultant, and administrator of nursing service as well as in her capacity as a practitioner.

The Swedish program, like the programs in the United States and many other countries, suggests a possible approach to the personal and social problems in maternity care. These *may* be met more effectively in the future through the use of a facility for normal obstetric patients constructed more like a home than a hospital, where more emphasis can be given by professional personnel on services needed to meet the social and psychological needs of the patient, and where auxiliary workers may be employed for routine care. This is an area requiring greater exploration and further experimentation on an international basis.

Dr. C.-E. A. Winslow probably would describe Sweden's progress in the health

field as an excellent example of "directed gradualism." Policies and methods that have been proved to be sound and practical have been accepted and carried out on a national basis. In summary, let us look at some of the accomplishments in Sweden's maternity care program:

1. Efficient and comprehensive care is provided at comparatively low cost.
2. Costs are borne by the whole population rather than by the individual.
3. Provision for care has been expanded into the most remote areas.
4. The consumer of the service has a part in determining policy and is entitled to choose the type of service she wants.
5. Environmental and social factors are recognized in planning a comprehensive health program.
6. The preparation of doctors, nurses, midwives, and home helpers is provided at State expense.
7. High standards are maintained through specialist service and consultation.
8. The right of the central government to determine broad policy *after* the interest of the group to be benefited has been enlisted has been recognized.

The dictum, "Sweden is a national unity," is as applicable to maternal care as it is to any area of life in this remarkable country.

Infant and Maternal Mortality in Taipeh, Taiwan (Formosa)

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IN view of the lack of a rigid system of reporting, accurate figures relating to birth and death rates in China are generally lacking, with the exception of perhaps a few cities. A fair system of reporting has existed in Taiwan (Formosa) since the Japanese regime of 1895–1945 and since V-J day. Of the nine cities on this island, data obtained in Taipeh are presumably more complete. It is hoped that the present paper will throw some light on the vital statistics of China as exemplified by figures obtained in one city.

GENERAL INFORMATION ON TAIWAN (FORMOSA)

Taiwan is an island of 13,800 square miles, situated in the subtropical and tropical zones about 100 miles off the southeast China coast. It was under Japanese occupation from 1895 to 1945.

During the Japanese regime, a census was said to be taken once every five years and the information on population movement was in the hands of the local police. The majority of the population consisted of people from Fukien Province across the Formosan strait, these people having migrated to this island over the preceding several hundred years. The aborigines do not exceed 3 to 4 per cent of the total population.

A recent influx of population from the mainland was started shortly after V-J day, the greatest increase occurring in 1948 and 1949. The average population of Taiwan before 1945 was between 5,000,000 and 6,000,000. There has been an increase of over 1,000,000 people in 1948 and 1949, during which period two censuses were taken.

Taipeh, the capital of the province, is situated in the northern part of the island. The only medical school of the province is located in this city. More medical personnel and hospital facilities are found in Taipeh than in any other city in Taiwan. Of the 3,247 physicians on the island, for instance, nearly 400 are found in Taipeh.

During the Japanese regime no formal training on nursing was given to Taiwanese. The first nursing school for Chinese was established in Taipeh in May, 1947. Another is being established now.

Most of the deliveries in Taiwan have been done by certified midwives who are required to have three years training in registered hospitals, both public and private. The method of their training is probably not standardized. Deliveries are done mostly in patients' homes. Some of the deliveries are done in hospitals or by health departments, and a few by untrained relatives.

The prototype of the present Provincial Health Department and of city and county health departments, was already in existence during the Japanese regime. There is a health department in each of the nine municipalities and

eight counties. The activities of these health organizations, however, are limited.

PRESENT SYSTEM OF URBAN BIRTH AND DEATH REPORTING

1. *Birth Registration*—All births are registered first with the local police station, within one week. The city health department collects these data periodically from the various police stations and transmits them to the Provincial Health Department.

Failure to register births probably does not occur often in view of the necessity of having individual identification cards, a system instituted here about the middle of 1948. These cards are required for school registration, purchase of food rations, employment, etc.

2. *Death Reporting*—All death certificates, with the exception of those for neonatal deaths and stillbirths, are signed by registered physicians and sent to the local police stations. These certificates are then forwarded to the local health department, which decides on the basis of the cause of death whether or not to issue burial or cremation permits. Such permits are strictly required before burial or cremation can take place.

Neonatal deaths are certified by either the attending physicians or the attending midwives. Failure to report neonatal deaths probably does occur frequently. However, in view of the custom that a stillborn or a dead new-born baby may still be entitled to a share of the family property, such reporting may not be too inaccurate. During the Japanese regime only male fetuses and babies were concerned in property sharing. As the custom stands today, fetuses and babies of both sexes are concerned.

BIRTHS IN TAIPEH, 1948 AND 1949

There were 6,578 births reported in 1948 and 14,578 in 1949. The population of Taipeh increased in the meantime from 379,400 to 483,578. Births increased 122 per cent, while population increased only 27 per cent.

The birth rates according to the figures available were:

TABLE 1

Birth Rate of Taipeh, 1948 and 1949

	Live Births	*Population*	*Rate per 1,000 Population*
1948	6,578	379,400	17.3
1949	14,578	483,578	30.1

The sex distribution of the 1948 and 1949 population was as follows:

TABLE 2

Sex Distribution of Population of Taipeh, 1948 and 1949

	Male	*Female*	*Total*
1948	195,866	183,534	379,400
1949	258,132	225,446	483,578
Increase of population	62,266	41,912	104,178
Percentage increase	32	23	26

There was an increase of over 100,000 in 1948 as compared with the population of 1947. It is possible that a large proportion of this increase consisted of government workers who had not brought over their families in 1948. It is also possible that many births were not registered prior to the introduction of individual identification cards in the middle of 1948.

MORTALITY DATA IN TAIPEH

1. *Source of Data*—Data relating to stillbirths and neonatal, infant, and maternal deaths have been taken from the records kept by the Taiwan Provincial Health Department and the Census Bureau of the Taipeh Municipal Government. It may be mentioned that the compilation of statistics in any province has been handicapped by a lack of competent statisticians to check as well as to record data so reported.

2. *Stillbirths*—The apparent lowering of the stillbirth rate in 1949 was again related in some way to the influx of

population from the mainland. It is possible that many of the stillbirths occurring in families from the mainland were not reported, as social custom does not dictate the necessity.

TABLE 3

Stillbirths in Taipeh, 1948 and 1949

	Stillbirths	*Live Births*	*Stillbirth Rate per 1,000 Live Births*
1948	114	6,578	13.7
1949	160	14,578	11.0

3. *Neonatal Deaths*—One hundred and sixteen neonatal deaths were reported in 1948 and 93 in 1949 in Taipeh. The neonatal mortality rates were 17.6 and 6.4 per 1,000 live births respectively. The low rates and the gross discrepancy between them were probably due largely to incomplete reporting and the apparent low birth rate of 1948. Table 4 gives the main causes of neonatal deaths.

4. *Infant Deaths*—Six hundred and sixty-six deaths of infants under one year of age were reported in 1948 and 575 in 1949. Infant mortality rates were 101.2 and 39.4 per 1,000 live births respectively. A gross discrepancy between the two rates is again evident.

Table 5 gives a list of the causes of infant deaths. These deaths include neonatal deaths.

5. *Maternal Deaths* — Twenty-four maternal deaths were reported in Taipeh in 1948 and 33 in 1949, giving maternal mortality rates of 3.6 and 2.3 per 1,000

TABLE 4

Causes of Neonatal Deaths in Taipeh, 1948 and 1949

	1948		*1949*	
	Number	*Percentage of Total*	*Number*	*Percentage of Total*
Prematurity	33	28.4	23	24.7
Tetanus	25	21.5	14	15.1
Bronchopneumonia	25	21.5	18	19.4
Diarrhea and enteritis	10	8.6	8	8.6
Syphilis	6	5.2	6	6.5
Other diseases of the respiratory system	5	4.3	7	7.5
Whooping cough	1	0.9	3	3.2
Others	11	9.5	14	15.1
Total	116	99.9	93	100.1

TABLE 5

Causes of Infant Deaths in Taipeh, 1948 and 1949

	1948		*1949*	
	Number	*Percentage of Total*	*Number*	*Percentage of Total*
Diarrhea and enteritis	172	25.8	191	33.2
Bronchopneumonia	158	23.7	137	23.8
Prematurity	63	9.5	29	5.0
Measles	29	4.4	0	0.0
Tetanus	25	3.8	20	3.5
Bronchitis	19	2.9	42	7.3
Whooping cough	10	1.5	20	3.5
Diphtheria	1	0.2	18	3.1
Tuberculosis (all forms)	0	0.0	16	2.8
Others	189	28.4	102	17.7
Total	666	100.2	575	99.9

TABLE 6

Causes of Maternal Deaths in Taipeh, 1948 and 1949

	1948		1949	
	Number	*Percentage of Total*	*Number*	*Percentage of Total*
Toxemias of pregnancy	7	29.2	11	33.3
Hemorrhages	6	25.0	6	18.2
Puerperal infection	5	20.8	6	18.2
Other accidents of childbirth	6	25.0	10	30.3
Total	24	100.0	33	100.0

live births, respectively.

The causes of maternal deaths are listed in Table 6.

The high incidence of toxemias of pregnancy is most likely related to the neglect of antenatal care on the part of the expectant mothers.

DISCUSSION

The data presented in the previous section can be summarized as follows (Table 7):

TABLE 7

	1948	*1949*
Birth rate	17.3	30.1
Stillbirth rate	17.3	11.0
Neonatal mortality rate	17.6	6.4
Infant mortality rate	101.2	39.4
Maternal mortality rate	3.6	2.3

These crude rates are in general lower than those obtained elsewhere in China. Before we proceed to examine the validity of the figures presented, it may be of interest to compare them with those obtained in Taiwan during the Japanese regime.

1. *Vital Statistics*—It may be stated at the outset that the circumstances under which the above data were collected are not known.

The maternal mortality rates for the various periods show the closest agreement. The 1949 infant mortality rate was somewhat lower than the 1938–1942 rates, while the 1948 rate was very much higher. Other 1938–1942 rates were much higher and were fairly close to those obtained in a few large cities on the mainland.

Neonatal deaths were not reported for 1938–1942, but according to the life tables constructed from 1936–1940

TABLE 8

Vital Statistics of Taiwan During Japanese Regime, 1938–1942

	1938	*1939*	*1940*	*1941*	*1942*
Population *	5,297,005	5,428,821	5,586,298	5,735,705	5,891,848
Live births	235,821	244,707	246,691	241,894	242,796
Birth rate	44.5	45.1	44.2	42.2	41.2
Stillbirths	7,983	8,846	8,611	8,468	9,060
Stillbirth rate	33.7	36.4	34.9	35.0	37.5
Infant deaths	12,081	11,915	12,421	9,513	11,024
Infant mortality rate	51.2	48.7	50.4	39.3	45.6
Maternal deaths	831	833	735	595	697
Maternal mortality rate	3.5	3.4	3.0	2.5	2.9
Total deaths	107,908	111,225	112,523	96,393	108,215
General mortality rate	20.4	20.5	20.1	16.8	18.4

* Population of Taiwanese only, excluding Japanese, other foreigners, and aborigines. Other figures also refer to Taiwanese only. All above figures were obtained from the Statistics Office of the Taiwan Government.

figures, the neonatal mortality rates were 71.4 and 53.2 for males and females respectively, again very much higher than the more recent rates.

A comparison of general mortality rates may also throw some light on the actual functioning of the reporting system. In 1948 there were 3,541 deaths reported in Taipeh, and 4,482 were reported in 1949, giving the same crude mortality rate of 9.3 for each year. The 1938–1942 rates were twice as high.

2. *Factors Affecting Mortality in Taipeh*—The factors contributing to the low general mortality can be summarized as follows:

Good health conditions of the people
Adequate medical facilities
Sufficient doctors, nurses, etc.
Higher proportion of younger age groups
Incomplete reporting

Data are not available as to the general health conditions of the people in Taiwan. The general impression is that as a result of better nutrition and less crowding, until recently, at least, the average health of the islanders may be slightly better than that of the mainlanders. But it is not enough to affect general mortality rates.

With regard to medical facilities, again reliable data are not available. But there is no question that they are grossly inadequate to meet the needs of the people. It is possible, however, that the use of antibiotics has lowered death rates to a certain extent.

There were 398 physicians in Taipeh as of the end of 1949, including new arrivals from the mainland. The ratio of physician to population was 1 to 1,215 persons, this being a better ratio than those found in other cities not only of this island but also of the mainland as a whole. But the financial inability of the people to utilize the services available, the standard of medical practice in general, the utilization of antenatal services, the conception of an adequate nursing service, the training given to midwives, and the like, are some of the points to be considered when studying the problem of medical care, especially as it relates to better health and lower mortality.

The factor of younger age groups affects infant and maternal mortality rates less than it does the general mortality rate. However, one is not impressed with any predominance of the younger age groups, nor with that of the aged, either.

The factors mentioned have probably contributed somewhat to lower mortality compared with those on the mainland, but the fact is inescapable that incomplete reporting was probably the most important single factor concerned.

3. *Comparison with the Asiatic Mainland*—Of the rates presented in this paper, only those of neonatal and infant mortality in some of the cities on the mainland are available.

Careful records were kept of a demonstration area of 120,000 population in Peiping by a health station established for teaching purposes by the Peiping Union Medical College and operated under the auspices of the city health department. The records on hand showed that of 2,487 and 2,638 live births in 1934 and 1935 respectively, there were 134 and 138 neonatal deaths, giving neonatal mortality rates of 54 and 52 per 1,000 live births. The infant mortality from 1926 to 1934 ranged from 113.1 to 203.0 per 1,000 live births.

Figures from the First Midwifery School in Peiping for the period 1929–1939 showed that in cases with prenatal care the neonatal mortality rate was 25.7, while in cases without prenatal care the rate was 70.9.

Figures collected elsewhere in China and which the writer is unable to document showed that the infant mortality rate ranged from 143.8 to 184.8 in varying periods in the 1930's.

These figures, collected over varying

periods of time and with varying degrees of reliability, do not lend themselves to easy comparison with those obtained in Taiwan. A cursory comparison indicates, however, that either the mainland figures of over ten years ago were significantly high, especially in infant mortality rates, or the Taiwan figures, especially of recent years, were unduly low. It is unfortunate that other figures obtained on the mainland are not on hand for comparison.

4. *Evaluation of Data*—The difficulties encountered in evaluating the present data are numerous, such as:

a. The influx of population in the period under study must in some way, as stated before, affect not only the apparent difference in the birth rates but also the adequacy of the reporting system itself.

b. Presumably the reporting system should be at its best in Taipeh, but time has not permitted the writer, who is not a trained statistician, to investigate the actual operation of that system, especially in recent years.

c. It is unfortunate that figures for 1947 are not available to show what rates prevailed prior to the exodus from the mainland; the unavailability was in itself related, in all probability, to the instability of current political conditions.

On the basis of the low birth rate, especially of 1948, and the very low general mortality rate, the reporting of which should have been relatively more complete, it may not be unsafe to assume that most of the figures presented for 1948 and 1949 were on the low side. While the true figures are elusive, a probable range may be proposed combining the present data with those obtained during 1938–1942, since conditions during the two periods were probably similar. It is possible, however, that serious errors may still be present in the proposed figures.

SUMMARY AND CONCLUSIONS

1. The system of birth and death reporting in Taiwan (Formosa) is reviewed.

2. Data relating to stillbirth, neonatal, infant and maternal mortality in Taipeh in 1948 and 1949 are presented, as well as birth and general mortality rates.

3. The probable reasons for the low rates are reviewed and it is suspected that incomplete reporting is probably the most important single factor.

4. Adjustment is made mainly on the basis of data obtained in earlier years. While errors may still be present, it is felt that in the absence of accurate data, the above figures at least give some indication of conditions prevailing in one city and probably in the country as a whole.

TABLE 9

Probable Range of Birth and Mortality Rates in Taipeh

	Per 1,000 Population	*Per 1,000 Live Births*
Birth rate	30–40	
General mortality rate	20–25	
Stillbirth rate		30–40
Neonatal mortality rate		50–75
Infant mortality rate		100–150
Maternal mortality rate		3–10

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Discussion

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JUST 26 years ago this summer it was my privilege to join the obstetrical and gynecological department of the Peking Union Medical College, where I served as a junior member of the staff for four years and subsequently returned in 1933 for a further two-year period. At the time of my first connection with the Peking institution, there were two members of the house staff, one a resident, the other an intern, whose subsequent contributions to obstetrics in China have been so noteworthy that it would seem worth while that this assembly become acquainted with these great leaders of our specialty in China.

The resident was a Chinese woman by the name of Marian Yang. A graduate of a mission medical school, trained in a mission hospital, she joined the house staff of Peking Union Medical College in 1922 and, as I have stated, was resident in obstetrics and gynecology when it was first my pleasure to become affiliated with that hospital. Dr. Yang, keenly aware of the deplorable status of obstetrics in her country and of the countless mothers and infants who were sacrificed through negligence, superstitions, and the gross ignorance of untrained and unclean native midwives, saw great visions for obstetrics in her country and took steps to make them actualities.

In order to augment her training, she came to the Johns Hopkins Hospital for a year's internship, went to England to study midwifery methods there, and, despite the fact that she was a trained obstetrician, went through the training in that country required for certification as a licensed midwife. Then she studied midwifery in the Norwegian countries. Finally, in 1927, she returned to Peking to inaugurate one of the most far-flung and salutary programs of midwifery that has ever been developed anywhere in the world. With the aid of the National Government, then located in Peking, she established the first midwifery school in that city in 1927. It was not long before she had 50 young women, all high school graduates, enrolled in a three year course—young women from every province in China. In this school, where over 2,000 women were delivered annually, these future midwives were trained over the long mentioned period in the fundamental techniques and safeguards of modern obstetrics. The first graduates of her school, after completing their three year course, then returned to their local province to start new midwifery schools themselves, under Dr. Yang's remote supervision. Today over 50 such schools are in existence, still under the general supervision of Dr. Yang, who holds the position now as

Director of Maternal and Child Hygiene in China.

Prior to the establishment of her first midwifery school in 1927, there was not a single trained midwife in China and only a handful of Chinese doctors who were competent in our specialty. Today the graduates of her schools are to be numbered in the thousands and are practising their specialty in the uttermost ends of that vast country. Although Dr. Yang could not attend this conference, it seems to me appropriate that we pay tribute to this woman who, almost singlehanded, has done more than anyone else to introduce modern obstetrics to a quarter of the world's population.

The other member of the house staff whose acquaintance it was my privilege to make in 1924, when he was a beginning intern in obstetrics and gynecology, is our speaker this morning, Dr. S. W. Lee. His career has followed a different path from that of Dr. Yang, but his contributions have been equally notable. After receiving complete training in his specialty at the Peking Union Medical College, he was subsequently appointed to the Professorship of Obstetrics and Gynecology at the Central Medical College in Nanking, where he in turn trained hundreds of other young Chinese men and women in the principles and practice of modern obstetrics; and these young men and women in turn went to other institutions to train still others, *ad infinitum*. Just as Dr. Yang's function has been the training of midwives, Dr. Lee's service has consisted of inculcating the highest ideals of obstetrics into countless physicians.

It is hence a special privilege for me to welcome Dr. Lee to this Conference, because his presence here brings back memories which extend over a quarter of a century. With the coming of the war he was forced to move to Formosa, and there he is carrying on the same fine work that characterized his activities in China. The paper he has presented is a judicious analysis of maternal and fetal mortality in Formosa and is informative in many respects. First, let it be noted that both the maternal and fetal mortality rates are low when it is considered that the facilities for care in that country, both from the viewpoint of personnel and equipment, cannot match those in most occidental areas. Furthermore, he has to deal with a less enlightened populace, and much educational work will be necessary before the complete coöperation of patients can be obtained, a relationship which is prerequisite for good prenatal care as well as for optimal neonatal conditions for the babies.

By way of documenting this statement, let it be noted that the incidence of neonatal deaths from tetanus, namely, 21.5 per cent of the total in 1928 and 15.1 per cent of the total in 1948, attests clearly to the fact that extensive educational work must be done among midwives and mothers in the rudiments of aseptic care. The fact that the toxemias of pregnancy stand first as a cause of death in his series reflects further, no doubt, as Dr. Lee himself indicates, inadequate prenatal care consequent upon lack of coöperation on the part of the childbearing women in that country. Here again education of the populace in the broad field of public health is prerequisite to the best results.

The problems presented by childbearing in China are so many and vast that it is not possible to discuss them at length in the few minutes at my disposal, but it must be apparent from the few remarks I have made, that of fundamental importance are the continuation and expansion of the educational program for midwives, doctors, and populace which Dr. Yang and Dr. Lee have fostered these many years. In the quarter of a century that these two obstetricians and their many colleagues have been attacking these problems,

notable benefits have been conferred on a substantial fraction of the childbearing women of China and their infants. Moreover, because of the midwives and physicians they have trained to the second and third generation, it is to be expected with confidence that these benefits will increase in geometrical progression, to the end that the safety of mothers and infants in that great country will be immeasurably enhanced.

Evolution of British Maternity Services

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I SHOULD like to express my appreciation of the honor you have paid me by your invitation to address this Congress. Before so many world-famous obstetricians I feel that my story of our maternity services may seem tame in comparison with the more dramatic account of clinical achievement which forms the main thesis of the Congress.

I am sure you will understand that it is difficult to cover such a wide field as the title of my address suggests in a short space of time. However, I will try to be concise and to concentrate on the basic principles and salient features of our service. For this purpose, I propose to divide my address into three parts:

1. Historical background of the midwifery services.
2. Development of the maternity services.
3. Maternity medical services under the National Health Service Act.

We in Britain like to evolve things slowly and to build up our institutions or services by trial and error. The present maternity services have been founded on a sound domiciliary midwifery service in which the keystone of the arch has been the trained midwife who is competent to undertake normal midwifery, to recognize any deviation from the normal, and to decide, on her own responsibility, when medical advice becomes necessary. In other words, our midwives are the practitioners for normal cases, as they are in Holland. This is an important factor to remember for a proper understanding of how our maternity services have developed and reached their present stage of maturity. A flash-back into the past may help to illustrate my point.

The first historical landmark was reached in 1726, when Scotland took the lead in instituting a Chair of Midwifery for the teaching of midwives. It is significant that the training in obstetrics of doctors in Britain did not become compulsory for another 160 years. In the early 1800's the Obstetric Society of London decided to grant a diploma to midwives who could display a minimum of efficiency. The Midwives Institute was founded in 1811 to raise the efficiency and improve the status of midwives throughout the country. Sixty years later it became the College of Midwives, and in 1947 was granted a Royal Charter.

From this point onward the history of midwifery is largely the story of the attempt to build up an efficient and adequate service by legislation, enactment, and statutory regulation.

A milestone was reached in 1902, when the Midwives Bill was placed on the Statute Book, and the Central Midwives Board was established to secure the certification of midwives in England and Wales, together with local supervising authorities (or health authorities) to whom the practising midwives had to notify their intention to practise. Little further progress was made until the Midwives Act was passed in 1936. This Act, which did so much to improve the status and conditions of work of midwives, placed on local supervising authorities the duty of providing an ade-

quate service of trained midwives for all mothers desiring to use the service, fees being recoverable so far as the patient's income allowed. The Act resulted in the majority of midwives becoming full-time salaried officers. It also empowered the Minister of Health to make an order prohibiting the attendance for gain of any person at a childbirth or lying-in, other than a state registered nurse or a state certified midwife, in any area where he was satisfied that an adequate service had been provided.

Consequently, from 1936 onward we had a fully staffed domiciliary service. At the same time, the other branches of the maternity services were also being further developed. The Maternity and Child Welfare Act of 1918 empowered local authorities to provide antenatal clinics for the routine examination and supervision of pregnant women by experienced medical officers. These clinics were attended by midwives and public health nurses who were responsible for the individual and group teaching of the prospective mothers to prepare them for motherhood.

The midwife who was engaged for the confinement attended the clinic with her patient whenever possible and was present during the medical examination. The patient could engage her doctor as well, if she could afford to pay his fees; otherwise the midwife would summon him for medical aid if required. His fee would then be paid by the local health authority, the mother contributing what she could afford. The doctor could call in a consultant obstetrician for a second opinion if desired, his fee being covered in the same way. Two-thirds of all births were delivered in the homes under these arrangements.

Sufficient maternity beds were available in hospitals and maternity homes to care for complicated cases and for mothers who wished to be hospitalized for their confinement. Fees were recovered according to the patient's means and no mother lacked a maternity bed because of poverty.

The standard of these provisions varied in different parts of the country, and in certain areas the maternal mortality rate was unduly high, thus indicating that all was not well. In 1935, the Ministry of Health undertook a special inquiry into the midwifery services in the so-called "black areas." During this investigation, a number of weaknesses in the service were revealed which led the Ministry to advise local health authorities how they could best improve their arrangements for maternal care. The main points to which attention was drawn included the establishment of an adequate service of obstetric consultants: (1) to assist general practitioners; (2) to hold consultative antenatal and postnatal clinics; (3) to organize emergency obstetric units. These "flying squads," as they were called, were based on maternity hospitals and consisted of an obstetrician and a midwife who were always available to the general practitioner to go out into the home and treat a patient whose condition was too grave to permit her removal to hospital. Equipped with blood transfusion apparatus, they were ready to attend cases of shock, hemorrhage, or retained placenta, etc., where transfer of the patient to hospital without special treatment was contraindicated.

Other measures which were advocated related to the development of more antenatal and postnatal clinics, a "home help" service and better arrangements for the interchange of records between doctors, clinics, and hospitals to promote continuity of supervision and treatment.

The importance of educating mothers and the general public to use the services provided for the reduction of the maternal mortality rate was not forgotten, nor was the value of providing

extra nourishment for both expectant and nursing mothers as required.

As you will appreciate, the general effect of implementing such recommendations was to improve the efficiency of our maternity services, not only in the special areas but all over the country. These measures, coupled with the introduction of the sulfonamide drugs in 1936, effected a noticeable reduction in the maternal mortality rate. At the turn of the century the rate then classified as "mortality of women from puerperal causes in childbirth per 1,000 children born alive" was 4.69. Over thirty years later it was still over 4.0 per 1,000 total births, but the decline began in 1935 with a drop to 3.49, and by 1939 the rate had been reduced to 2.82 per 1,000 total births. It is good to record that the fall continued with little fluctuation throughout the war years, until in 1948 we had our lowest record figure of 1.02.

Hospital Policy—So much for the evolution of the domiciliary services. Before the war the Ministry's hospital policy (based largely on the findings of the Maternal Mortality Report) was to encourage the provision of maternity accommodation in departments of general hospitals rather than in separate maternity hospitals. It was expected at that time that the majority of confinements would take place in the patients' own homes; nevertheless, the demand for maternity beds was increasing rapidly, and in some large urban areas by 1938 at least half the births were occurring in institutions (e.g., London 52 per cent, Manchester 59 per cent, Leicester 58 per cent, but Birmingham 33 per cent). During this period there was little selection of cases for admission and most mothers wishing to enter a hospital were able to do so.

By the beginning of the war, therefore, institutional midwifery had ceased to be mainly the problem of treating the abnormal case and had become one of providing for a smaller number of abnormal and a larger number of normal cases, especially primiparas and those with bad housing conditions.

During the war, as part of the evacuation scheme a large number of beds was provided in emergency homes for selected normal cases evacuated from "target" areas. These homes were usually established in converted premises, provided with simple facilities, and linked with hospital units to which abnormal cases could be transferred. The vital statistics for these homes as regards infant and maternal mortality and stillbirth rates were good and suggested that there might be a permanent place for such accommodation in future planning. Moreover, the location of many of these homes in country areas led to more requests for admission of local cases, thus adding to the increasing demand from urban populations. A rising birth rate, together with housing shortages following the war, increased the pressure on maternity beds. The point had now been reached where some 50 per cent of all births occurred in institutions.

Such was the picture in June, 1948, before the National Health Service Act came into operation—we had a comprehensive midwifery service, supported by general practitioners with consultant domiciliary obstetric services and flying obstetric squads backed by hospital accommodation, as required. The obvious weaknesses of the scheme were, first, that a general practitioner called in by a midwife requiring medical aid for a case during labor or the puerperium might not have seen the patient before; and second, the medical officers at the antenatal clinics, being usually full-time officers of the health authority engaged in the conduct of maternity and child welfare clinics, rarely undertook confinements. The antenatal clinics, originally established because the then general practitioners did not undertake

adequate antenatal care for their patients, had become an integral part of the scheme. They were attended by approximately 75 per cent of expectant mothers who received a high standard of antenatal care.

If I have made myself clear in the foregoing remarks, you will understand that our maternity services were well developed but lacked continuity of medical care. The introduction of the National Health Service Act enabled us to provide additional maternity medical services by grafting them onto the existing arrangements for maternal care. Before describing this new part of the service in detail, I should like to remind you of the main objects of the Health Act and how it is hoped they will be achieved.

The chief purpose of the Act is to provide medical advice and care for every man, woman, and child who needs them. The term "medical care" covers the whole range of service, from the nurse and family doctor to the hospital and consultant. For administrative reasons, the service is divided into three main branches:

1. The hospital and specialist services, which are administered by 14 new Regional Hospital Boards and Hospital Managements Committees.
2. The local health services, which are the responsibility of the major local health authorities (the County Councils and County Boroughs).
3. The general practitioner services, which include those of the doctor and dentist and are organized by local executive councils.

These three parts of the service are coördinated by means of regional and local committees on which the different interests are represented.

It was clear that special arrangements would have to be made to enable the expectant mother to have the doctor of her choice. At the same time we wanted that doctor to have had postgraduate experience in obstetrics but this was difficult to arrange. Those doctors who were regarded locally as having the necessary experience are termed general practitioner obstetricians and their names are included on a list called the "Local Obstetric List." This attempt to provide a specialist service does not, however, exclude the ordinary family doctor from booking a case for antenatal care and the confinement if he, and his patient, wish to enter into such an arrangement.

Under the regulations, a doctor undertaking maternity medical care is required to contract with the patient to provide the following minimal services:

1. To undertake antenatal care, including an initial medical and obstetric examination at the first visit.
2. To reëxamine the patient at the 36th week of pregnancy and at any other time that he thinks necessary.
3. To attend the patient at the confinement if he considers it desirable or if summoned by the midwife.
4. To provide medical supervision for mother and child for 14 days after the confinement if required, and finally postnatal care, including a medical and pelvic examination of the mother at or about 6 weeks after delivery.

That is the scope and range of the service for which a comprehensive fee of 7 guineas (or about $21) is paid to the general practitioner obstetrician. The fee is the same whether or not the doctor attends the confinement.

It might make it clearer if I applied this description of the service to an individual case, showing the relationship between the doctor, midwife, and the other members of the obstetric team.

When a woman thinks she is pregnant, she probably first consults her family doctor. If he confirms the diagnosis of pregnancy and does not wish to undertake the case, he will advise the expectant mother to select a general practitioner obstetrician from the obstetric list. The latter will then make a complete medical and obstetric examination, and will advise the patient whether or

not she should have her confinement at home, depending on the history and normality of the case and the home conditions. If hospitalization seems advisable, the doctor will refer his patient to the hospital, which will then assume responsibility for the antenatal, natal, and postnatal care. If the decision is in favor of a home confinement, the expectant mother will engage a midwife, as well as the general practitioner obstetrician. Unless the general practitioner obstetrician wishes to assume complete responsibility for the antenatal care he may agree to his patient's attending the nearest local health authority antenatal clinic for the more frequent and routine antenatal supervision which is so desirable.

There, at the clinic, the mother will have her urine and blood pressure examined, her blood taken for Wassermann and Rh testing. She will receive instruction in the preparation for motherhood, care of the breasts, diet, exercise, etc. She will be advised to attend the clinic monthly in the early months of pregnancy, be visited by her midwife in the home for the latter's share of the antenatal care, and be advised on the preparation for the confinement. At the 36th week the mother will return to her doctor for further obstetric examination and study of her case. If any abnormality has arisen during pregnancy, the clinic doctor will have advised the general practitioner obstetrician of the condition.

At the more frequent visits to the antenatal clinic in the latter months of pregnancy, the mother will have a demonstration of the use of the gas and air apparatus, so that she will be familiar with the administration of analgesia, by the midwife trained to use it, during the second stage of labor. If all goes well, and unless the doctor and mother wish it, the general practitioner obstetrician will not attend the confinement unless he is sent for by the midwife. The procedure to be followed should have been decided in previous consultation between the doctor and midwife. Whether or not the doctor attends the confinement depends on the circumstances of the case, but he will complete his maternity medical care by undertaking a postnatal examination, including a pelvic one, at the sixth week.

Such is the practice in an ordinary case, but at any stage of pregnancy, or labor, or the puerperium, the doctor has available at his disposal the services of a consultant obstetrician or the flying obstetric squad in the home, or he can transfer his patient to the nearest hospital if the need arises.

So much for the professional aspects of the maternity medical service. Now let us consider the health and welfare side.

When pregnancy is confirmed by the general practitioner obstetrician, the patient is referred to the local food office to obtain her unborn baby's ration book. The expectant mother is now entitled to one pint of cheap milk per day, free cod liver oil or vitamin A and D tablets, and cheap concentrated orange juice, extra eggs, cheese, butter, and fats, and an additional half ration of meat (you know, we are still strictly rationed in Britain). For the confinement, the mother is eligible for a free maternity outfit containing all the necessary equipment required by the attendant for the home delivery and the necessary dressings throughout the puerperium. If required, a home helper may be available to take over her domestic duties in the house during the labor and lying-in period. The midwife visits her twice a day, for the first few days, to nurse her and bathe the baby. These visits are continued daily, until the midwife's responsibility ceases on the fourteenth day. The birth will have been noted to the Medical Officer of Health and the public health nurse takes over the case and advises the mother on her own

health and that of the baby, until she can bring it to the child welfare center about the third or fourth week. Here the infant is weighed and examined, and advice is given by the clinic doctor.

The daily pint of cheap milk is continued for the nursing mother, or is given to the child if artificial feeding is required. The baby now gets the free cod liver oil and cheap orange juice until it is five years old. The mother is encouraged to bring the child regularly to the clinic, and the periodic home visits are continued until the child attains school age.

That is our scheme. Now, how has it worked in the 20 months since July, 1948? As in all services, the machinery devised to operate them has to be tested and given time to settle down to a normal rhythm. In a number of areas difficulties arose. Some doctors did not understand that they received their comprehensive fee even when they did not find it necessary to attend the confinement. This confusion caused apprehension among some midwives, who felt that they had lost prestige and status by becoming maternity nurses acting under medical direction. Other doctors failed to appreciate that they were now members of the obstetric team and did not always advise their patients of the other benefits available to them under the scheme, such as attendance at the antenatal clinics with their facilities for teaching mothercraft and for routine supervision, taking of blood, etc., which are not so readily provided in the doctor's busy surgery.

As a result of some of the confusion, Medical Officers of Health feared that the standard of antenatal care might have deteriorated in their areas, where fewer mothers were in attendance at the antenatal clinics. But all these disruptions can be, and are being, overcome by a more general appreciation of the need for coöperation by every member of the obstetric team. If the best possible maternity service is to be provided under the National Health Service, the general practitioner, the midwife, the antenatal clinic, and the pathologist as well as the Medical Officer of Health and his staff, the hospital and specialist services, all have their parts to play for the good of the mother and her child.

The administrative division of the services into three parts, hospital, local health authority, and local executive council, has given rise to criticism in some circles. We are aware of the difficulties that are bound to occur, but as time goes on and in the light of experience, adjustments will be and are being made to promote smooth running and improved efficiency where these seemed lacking.

Coördination of the three parts of the service can be achieved by means of local maternity committees on which are represented the different interests concerned. In many areas these committees have been established and are working well, ironing out difficulties and adjusting the service to the needs of the particular area. The Minister has a Standing Advisory Committee on Maternity and Midwifery Services to consider the various problems as they arise and to advise him on measures for improving and coördinating the service.

If we are patient and constructive in our outlook, I think we can look forward to the organization of an obstetric service of selected general practitioner obstetricians to support the midwife, with all the hospital and consultant facilities of the area within call as required. The development of better housing conditions, home help schemes, and improved hospital accommodation will still further complete the service. We have accomplished a certain amount, but there is still much to be done and we are by no means complacent.

It is too early to assess accurately the merits or demerits of these new additions to our maternity service. I have

tried to give you briefly a fair and frank picture of what we have done. Mistakes may have been made and only time will show whether our efforts to improve the maternity services will achieve their objective. Measures to save maternal and infant lives deserve the highest priority and demand the best professional skill that is available, whether it be in the home, the hospital, or a government office. These forces have been marshalled in Britain in launching the National Health Service.

The future will decide whether or not we have been successful, and the results will be reflected in the vital statistics and in the health and welfare of our mothers and children.

Discussion

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DR. TAYLOR has given us an excellent and concise account of the history and development of midwifery services in Great Britain and an equally good account of the shape of affairs at this time.

The importance of this history cannot be overemphasized. Until introduction of the National Health Service in July, 1948, there was equilibrium so far as maternity services were concerned. We might say that there was a triangle of action, with the well trained midwives at the apex and the general practitioners and specialist obstetricians at the base. With the granting of a Royal Charter to the College of Midwives in 1947, one would have thought that this equilibrium would have continued for many years.

However, for reasons which need not be discussed here, the obstetric care provisions of the new service, as it were, rotated this triangle of action and brought the general practitioner to the apical position, relegating the midwife to the base. The consequences of this are many and important and I will discuss some of them.

First of all, let me point out that the patterns of obstetric care vary from country to country and even from one geographical area to another within any given country. For example, as Dr. Taylor has pointed out, a very significant proportion of confinements in Great Britain are done in the homes by trained midwives, and this also is the case in Holland. Here in the United States, at least in the urban areas, an ever increasing proportion of confinements is done in large institutions under the direction of specialist obstetricians. Even in remote rural areas the younger practitioners are sending mothers to city hospitals for delivery and attention by obstetricians, rather than face the problems of domiciliary confinement. In New Zealand there has developed a pattern of care in which the general practitioner plays the role of the specialist in normal midwifery; there he conducts his confinements with the help of a maternity nurse, in small nursing homes built for this purpose.

All these patterns have their good and their bad points, and the validity of any one of them can be substantiated by ever better figures for maternal and infant mortality and morbidity.

I would be the last to challenge the

wonderful contribution made by the British midwives, and when one knows personally the handicaps under which they have had to work—handicaps of bad housing, sometimes bad nutrition among the mothers and babies they deal with, difficulties of transportation, and sometimes even simple hygiene—one's admiration is unlimited.

But I think we must ask ourselves the question, in spite of all that has been achieved, is this the best method of obstetric care? And we must again ask, is the disturbance of equilibrium I referred to justified, in the short run or in the long run?

I pointed out that the general practitioner has supplanted the midwife at the apex of the triangle of obstetric action. The immediate consequences of this are undeniably bad. Many of these practitioners are plainly not competent in the art and skills of even normal midwifery. Largely because so many of these practitioners and their predecessors shed or failed to meet, for whatever reasons, their responsibility for antenatal and obstetric care, we have seen the growth, development, and stabilization of the maternal and child welfare clinic and the program of domiciliary midwifery by trained midwives.

Within the new service in Britain the classification of general practitioner into g. p. obstetrician and g. p. non- or better, semi-obstetrician, is tacit professional recognition of this state of affairs. Many of these men, particularly in the latter group, are frankly not interested in the problems of antenatal and obstetric care. However, because a statutory fee is now involved for this work it is only human that the doctor should want to exercise his prerogative in this field.

I do not think it is necessary to elaborate on this point. The obvious direct dangers are self-evident and in my recent survey of Britain I saw plenty of objective evidence which indicated that these dangers were more than hypothetical. Many midwives and obstetricians with whom I spoke were hoping that the general practitioners would "book" cases (which alone renders them eligible for payment) but would leave the care of the mothers to the midwives, obstetricians, and maternity and child welfare clinics.

In the short run there is no doubt at all in my mind that the immediate results of this disturbance of equilibrium must be bad—bad not only in the direct way of exposing mothers and babies to the unnecessary hazards of poor care, but bad also indirectly in so far as all this is having an adverse effect on the morale of and recruitment to the midwifery services.

However, what happens in the long run is perhaps more important, and that raises the question of what is the best pattern for normal obstetric care.

In my opinion, if the term "family doctoring" is to have real meaning, then the family doctor must be responsible for the full care of the normal expectant mother—antenatal, delivery, and postnatal care, and subsequently for the care of the child in health and through the whole range of the "normal" illnesses of childhood. Either this, or we must accept the fact that "family doctoring" in this enlightened day and age is an impossibility and that the dictates of modern medical knowledge and technique demand the fractionation of care into many specialties. Personally I do not accept this as a fact and I am pleased to see the general practitioner in Britain resuming responsibility for obstetric care. However, I must add some qualifications to this expression of pleasure:

1. If the general practitioner is to resume, or in some cases assume, these responsibilities, everything possible must be done to see that he attains the highest standards of work. Regrettably, there is to date little evidence that steps are being taken in this direction.

2. It would be easy for the responsibilities for normal midwifery to pass from the hands

of the midwives to the hands of the obstetric specialists working in large institutions, with the general practitioner acting as no more than a temporary intermediary in the transaction. This is a real and (in my opinion) undesirable possibility, and could well eventuate unless the general practitioners *really* accept their responsibility and give cognizance to the question of quality of work.

I have labored this question of the changing pattern of obstetric care in Britain quite deliberately, because unless there is full recognition of the significance of this change, we might well see the destruction of an effective maternity service which at present operates within the limits of the national economy and the substitution of a new institutional specialist service, infinitely more expensive and of dubiously greater merit. On the other hand, if we recognize the significance of what is happening, we can do a great deal not only to advance the quality of maternity services but also to bring reality to the present somewhat mythical "family doctor" concept.

Before concluding, I should like to deal with one specific point in Dr. Taylor's address. If we analyze the account she has given of how the expectant mother receives her attention during pregnancy, we find that as many as five separate medical agents can come into the picture—the family physician, the g. p. obstetrician, the midwife, the hospital, and the maternal and child welfare clinic—and it is possible that the individual mother can be shuffled from one to the other of these agents numerous times during her pregnancy. In reality she rarely deals with more than two of these agents, but in normal cases this is just one too many and the sooner care of the expectant mother is personalized and concentrated in the hands of one *competent* person, the better. This person should surely be the "family doctor." This is most certainly possible within the terms of the National Health Service in Britain.

In conclusion, I must agree with Dr. Taylor that the measure of success of what we are trying to do in behalf of our expectant mothers and expected children "will be reflected in the vital statistics and in the health and welfare of our mothers and children," but I would also add that some of the human imponderables associated with all aspects of medical care (and not least with obstetric care) cannot be measured by a statistical yardstick. We must nonetheless not lose sight of these.

Maternity Service Under the Health Insurance Plan of Greater New York

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THE Health Insurance Plan of Greater New York began service in March, 1947, under the New York State Insurance Law as a voluntary nonprofit enterprise to provide comprehensive medical care to insured families through general physicians and specialists organized as medical group practice units. Under this prepayment plan, which has been in operation for only three years, almost a quarter of a million persons are receiving preventive, diagnostic, and curative medical services without any financial or other deterrent. The premium covers the complete cost, and 28 medical groups located in various parts of the city provide these services to the subscribers in their homes, in medical centers, in physicians' offices, and in hospitals, in return for capitation payments. This paper will report upon the maternity service rendered during the period of a year, from July 1, 1948, to June 30, 1949, when the family enrollment in the Plan went from 100,000 to almost 200,000 persons

The insured population consists in large part of the employees, together with their eligible dependents, of the United Nations and of the City of New York, including large enrollments from the public schools and institutions of higher education, the transportation services, the Departments of Sanitation, Parks, Public Works, the Courts, and many smaller municipal units, as well as some social agencies, labor unions, and employee groups in private employment. The majority of the families are in a low-income category.

THE HIP PROGRAM

To perform the medical services guaranteed to subscribers, HIP enters into contracts, not with individual physicians but with organized medical groups, now numbering 28 scattered throughout New York City. The groups are composed of 25 or more general physicians and specialists. They are expected to develop genuine group practice with properly equipped medical centers. The subscriber first chooses his medical group and then one of the general physicians on its staff to serve as his "family doctor." Prominent among the 12 major specialties in every group are obstetrics-gynecology and pediatrics.

Persons on the basic premium for family coverage pay $34.56 per year for one person, $69.12 for a couple, and $103.68 for three or more persons.

People are enrolled in employee groups, the employers paying at least half of the premium. With the employer paying half, the cost to an unattached worker is 33 cents a week, to couples 66 cents a week, and for a family of any size about $1 a week. HIP has many families with five or more persons to be covered at those rates.

The medical groups receive a capitation payment of $23.04 per year for every member of each family, even though there may be 14 members. At the present moment the 28 medical

groups are receiving capitation payments in the amount of $5,500,000 a year for the medical care of 235,000 persons. The groups, which are partnerships, remunerate their members by salaries based on their rank and the time they devote, whether full time, half time, or quarter time. Most members of the groups still continue to do ordinary private practice as well.

All HIP subscribers are expected to carry hospital insurance under a separate contract and all specialists must have hospital privileges.

There are no waiting periods under HIP coverage, and responsibility is accepted for preëxisting conditions. Within a few months after the Plan had been launched, obstetrical deliveries were therefore being performed as a part of the benefits to which enrollees were entitled. At present the HIP medical groups are reporting about 130 deliveries per month.

QUALIFICATIONS OF HIP PHYSICIANS

The qualifications of all physician members of medical groups are scrutinized with care by the HIP Medical Control Board, a body composed of physicians nominated by the HIP Board of Directors, by the New York Academy of Medicine, and by the county medical societies. The medical groups also have representation on the HIP Medical Control Board, one from the groups in each borough of the city.

Altogether there are approximately 845 physicians serving on the staffs of the 28 groups, 334 general physicians, and 511 specialists. In March, 1950, there were 28 men serving as chief obstetrician-gynecologists and 32 as associates. Of the 28 chiefs of obstetrics and gynecology, 24 are diplomates of the American Board of Obstetrics and Gynecology, another is an attending obstetrician in an approved hospital, and the other 3 are rated as fully qualified by the Medical Control Board; that is, these men presented credentials that in the opinion of the Medical Control Board justified their acceptance as chiefs in this service. Of the 32 associate obstetricians, 10 are diplomates of the American Board and 22 presented credentials that were acceptable to the Medical Control Board.

In the beginning the medical groups were free to decide how the service to maternity patients would be divided, as between general physicians and obstetricians. Since every group had to have an obstetrician-gynecologist on its staff, it was of course expected that in all instances in which the medical group looked to its general physicians for obstetrical services, the obstetrician would serve as a consultant. But from the beginning, a majority of the medical groups routinely referred all pregnant women to their obstetricians. In May, 1949, the HIP Medical Control Board ruled that "all obstetrical services shall be rendered by the chief and/or his associates who meet the qualifications as set for them in the medical standards, except that a general physician, with the approval of the chief of this service, may be permitted to provide obstetrical care in a normal pregnancy when the subscriber specifically requests his services." Since then, 90 per cent of all HIP deliveries are made by obstetricians. The chief of the obstetrical service is held responsible for all obstetrical services rendered by the group and is expected to arrange a schedule whereby either he or his associate is available at all times for emergency care.

DEFINITIONS AND MEASURES OF COMPARISON OF HIP WITH OTHER EXPERIENCE

For a population of the size of the HIP enrollment, the number of births reported by the medical groups is low. In part this arises from the age-sex composition of our insured population; it has a deficit of young women in the

early childbearing ages. (See Figure 1.) Second, it has had an ascending enrollment, with some entrants coming into the Plan pregnant but with all their arrangements for confinement made elsewhere. Both they and the medical groups are loath to disturb those arrangements. We also know that some of the older women were unwilling to transfer to new obstetricians for their current confinements, although their private physicians often used HIP medical groups for the more expensive laboratory services.

We are unable, therefore, to establish as yet a true birth rate for HIP female enrollees of childbearing age. On the other hand, pending the 1950 census returns, New York City is also unable to establish a rate for such women in the general population because, although it knows the number of live births, it does not know the size of the population of women among whom these births have occurred. Rates of incidence of obstetrical problems based upon estimated total population have no statistical validity. But there are data on some phases of the total obstetrical experience in New York City against which the HIP experience can be set.

THE MORTALITY EXPERIENCE

During the specified year a total of 1,015 deliveries coming within the definition were fully reported by 71 physician members of medical groups; with 10 sets of twins, there are 1,025 infants to be accounted for. A diligent inquiry on each delivery routinely reported to HIP brought to light no maternal death. Further inquiry was made about every woman dying from puerperal causes reported to the New York City Health Department during the 12 month period under review to ascertain whether or not

FIGURE 1

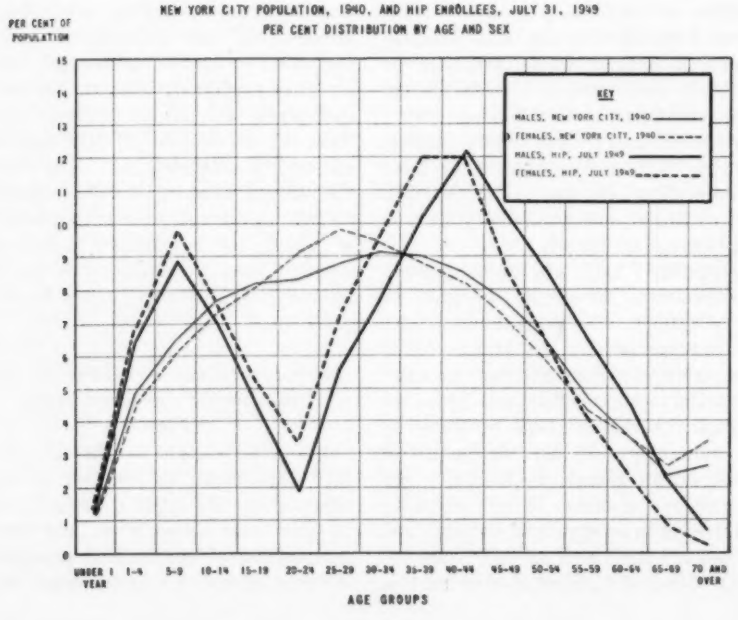


TABLE 1

Percentage Distribution of Infants Born Alive or Dead by Parity and Age of Mother New York City, 1948, and HIP, Year Ended June 30, 1949

	Number of Infants	Percentage Distribution—Age of Mother				
		Total	Under 25 Years	25–34 Years	35–39 Years	40 Years and Over
Live Births						
Primiparas:						
New York City [1]	65,690	100.0	52.2	43.2	4.0	0.6
HIP	448	100.0 [3]	22.8	65.2	9.2	2.4
Multipara:						
New York City [1]	92,279	100.0	20.9	61.9	14.1	3.1
HIP	557	100.0 [4]	5.5	62.3	25.7	5.4
Fetal Deaths [2] (Gestation 28 weeks and over)						
New York City [1]	3,065	100.0 [5]	24.8	51.7	16.3	5.7
HIP	20	100.0	15.0	50.0	20.0	15.0

[1] Data from *Report of the Department of Health, 1941–1948*, City of New York, Tables 2 and 3, pp. 306–309.
[2] Data by age of mother and parity not available for New York City for fetal deaths involving gestation of 28 weeks or more.
[3] 0.4 per cent, age not reported.
[4] 1.1 per cent, age not reported.
[5] 1.5 per cent, age not reported.

the woman had been attended by a HIP physician. This check was made not only to guarantee that no such case had escaped the knowledge of the medical group through the failure of the doctor to report it, but also to learn of any death that might have occurred where a woman had had an abortion or a miscarriage, since women with pregnancies thus terminated are not covered in this report. No woman whose death was due to puerperal causes could be identified as an enrollee attended by a HIP physician, so that there are no data on maternal mortality to be reviewed in this report. There were 20 fetal deaths and 9 neonatal deaths.

With the HIP population deficient in women in the earlier childbearing ages, the HIP experience in obstetrics naturally shows higher proportions of older women who received such services than are found among the delivering women reported to the Health Department. The proportion of HIP primiparas, 35 to 39 years, was more than twice that reported for the City of New York and those over 40 years were four times that proportion. Multiparas of 35 to 39 years in the HIP groups were reported in almost twice the city proportion, as were those of 40 years of age and over.

The following facts are especially significant in view of the higher ages of the HIP women: (1) There was no maternal death. (2) The ratio of fetal deaths in the third trimester of pregnancy to live births is approximately the same as that for the younger women reported to the city. (3) The neonatal mortality was less than half that of the city as a whole. These three facts suggest that the quality of care provided under the HIP program conforms to prevailing medical standards. It is true that the number of HIP cases is not large and that in another year this experience may not be repeated, but this is the record on a full year's operation, which is the best we can do in submitting evidence on the outcome of the HIP experience to date. (See Table 1.)

THE CLINICAL EXPERIENCE

In Table 2 you will find for the 1,015 deliveries an analysis of five factors in relation to each other: the ages of the mothers, their parity, the presence of complications of pregnancy, the factor of prematurity, and finally, the deliveries

TABLE 2*

Deliveries by HIP Physicians by Age of Mother, Parity, Existence of Prenatal Complications, Fetal Maturity, and Type of Delivery (Twelve Months Ended June 30, 1949)

Age of Mother at Delivery	Number of Deliveries			Deliveries Without Prenatal Complications						Deliveries with Prenatal Complications					
				Full Term			Premature			Full Term			Premature		
	Total	Without Prenatal Complications	With Prenatal Complications	Spontaneous	Instrumental	Operative	Spontaneous	Instrumental	Operative	Spontaneous	Instrumental	Operative	Spontaneous	Instrumental	Operative
Primipara and Multipara															
Grand Total	1,015	869	146	727	66	19	54	2	1	121	5	4	11	1	4
Primipara															
Total	454	393	61	302	46	13	30	2	0	47	3	2	6	1	2
15–19 years	7	7	0	6	0	1	0	0	0	0	0	0	0	0	0
20–24 years	98	83	15	64[1]	13	1	5	0	0	11[22]	1	0	1[18]	1	1[21]
25–29 years	197	179	18	144[2]	13[7]	3	19[9]	0	0	12	0	2	3[16]	0	1[23]
30–34 years	98	84	14	65[3]	12	3	2	2	0	12	1	0	1	0	0
35–39 years	41	31	10	20	6	3	2	0	0	9	0	0	1[17]	0	0
40–44 years	11	7	4	2	1	2	2	0	0	3	1	0	0	0	0
45–49 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Age not reported	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0
Multipara															
Total	561	476	85	425	20	6	24	0	1	74	2	2	5	0	2
15–19 years	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0
20–24 years	29	22	7	21	0	0	1	0	0	7	0	0	0	0	0
25–29 years	147	127	20	111[4]	4	3	9[20]	0	1	18	0	1	1[18]	0	0
30–34 years	200	175	25	159	5	2	9	0	0	24[13]	0	0	1	0	0[22]
35–39 years	145	116	29	102	8	1	5	0	0	23[14]	2	0	2[19]	0	2
40–44 years	28	25	3	21[5]	3[8]	0	1[11]	0	0	1	0	1	1[20]	0	0
45–49 years	4	4	0	4[6]	0	0	0	0	0	0	0	0	0	0	0
Age not reported	6	5	1	5	0	0	0	0	0	1	0	0	0	0	0

* See Footnotes on page 49.

which were spontaneous, instrumental, and operative. Against these background factors, the footnotes indicate the fetal and neonatal deaths. This table constitutes a rough outline of the total body of clinical facts and forms the basis of the further description of the HIP experience.

In examining the categories here used, it should be borne in mind that:

1. All reported pregnancies of 28 weeks or over were included and the physician's statement as to maturity and prematurity was accepted, except that deliveries with issue weighing less than 5½ pounds were classified as premature irrespective of the statement of the physician as to the period of gestation.

2. Prenatal complications of pregnancy include both those which are the complications of pregnancy as such and the reported extrapuerperal conditions, such as heart disease, arthritis, diabetes, and syphilis. The uncomplicated cases are those characterized by the attending physician as having had no complications of either type.

3. Instrumental deliveries do not here include the low forceps cases, since the use of this technique was found almost routine among some physicians and the New York City Health Department also reports very frequent use. Episiotomies were not counted, since they are of no special significance and are routinely performed where indicated. The deliveries here classified as instrumental consisted of those in which mid forceps were used and of those with version and breech extraction with forceps. No case of the use of high forceps was reported in our series.

4. The operative deliveries included Caesarean sections of all types. Perhaps the most significant fact to be noted

* Footnotes to Table 2.

[1] Includes a fetal death, cause not stated, with breech extraction.
[2] Includes a neonatal death during first day caused by atelectasis.
[3] Includes two fetal deaths, one from atelectasis, other (with breech extraction) due to compression of umbilical cord.
[4] Includes two fetal deaths, one macerated fetus (mother had Rh sensitivity), other due to prolapse of umbilical cord.
[5] Includes a neonatal death at 28th day, due to Mongolism.
[6] Includes a fetal death due to intrauterine compression of cord (fetus macerated).
[7] Includes a neonatal death at 3rd day due to diaphragmatic hernia.
[8] Includes a fetal death due to premature separation of placenta (version and breech extraction).
[9] Includes a fetal death, macerated fetus (8 months gestation).
[10] Includes a fetal death (a twin) due to atelectasis, delivery assisted frank breech (8 months gestation).
[11] Involves a fetal death due to premature separation of placenta, period of gestation not stated, weight 4 lb. 14 oz.
[12] Includes a fetal death due to atelectasis, mother having arrested pulmonary tuberculosis; also a neonatal death during first day due to intraventricular hemorrhage, mother having severe vaginitis.
[13] Includes a fetal death due to Mongolism (fetus macerated), mother having Rh sensitivity and history of syphilis.
[14] Includes a fetal death due to anencephalia, mother having mild toxemia.
[15] Involves a fetal death, cause not stated, mother having bleeding in second trimester (7 months gestation).
[16] Includes two fetal deaths, one due to toxemia (8½ months), other due to diabetes of mother (8 months).
[17] Involves a fetal death due to toxemia (7 months).
[18] Involves a fetal death due to toxemia (7½ months).
[19] Involves a fetal death due to premature separation of placenta, period of gestation not stated, mother having vaginal bleeding; and a neonatal death at 4th day due to Mongolism (8 months), mother also having vaginal bleeding.
[20] Involves the neonatal deaths of twins at second day (6½ months) due to prematurity—weights of 1 lb. 9 oz. and 1 lb. 11½ oz.—delivery with breech extraction, mother having slight vaginal bleeding.
[21] Involves a neonatal death at second day due to atelectasis (7 months), Caesarean performed, mother having slight vaginal bleeding.
[22] Involves a neonatal death at third day due to aspiration pneumonia with atelectasis (7½ months), Caesarean performed, mother having toxemia.
[23] Includes a fetal death due to central placenta previa, Porro Caesarean, mother also having fibromyomata uteri, period of gestation not stated (5 lb. 1 oz.).

from these figures is that 727 women (302 primiparas and 425 multiparas), or 72 per cent, carried their children to full term without complications and bore them spontaneously, and another 121, or 12 per cent, who had complications during pregnancy, likewise reached full term and delivered spontaneously. Of these 848 women, 12 lost their babies, 9 as fetal deaths, and 3 as neonatal mortalities.

COMPLICATED PREGNANCIES THAT WENT TO TERM

Among 130 full-term complicated pregnancies there were only 3 fetal deaths. Toxemia of pregnancy appeared in 24 cases; in only one did a fetal death occur, due not to the toxemia but to a congenital abnormality (anencephalia). Uterine bleeding was a complication in 15 cases, and hyperemesis gravidarum or severe nausea in 9 cases, but no fetal deaths resulted in these 24 pregnancies. Of the nonpuerperal complications associated with full-term pregnancies, the most frequently reported (28 cases) were lesions of the genital tract, such as fibromyomata, ovarian cysts, cervical polyps, and monilia vaginitis. One of these cases had bilateral ovarian cysts removed during the first trimester without interrupting the pregnancy. Some of the other nonpuerperal complications were cardiac diseases, 13 cases; thrombosed hemorrhoids, 8 cases; pyelonephritis, 6 cases; and syphilis, 6 cases. None of these pregnancies ended in a fetal mortality except one with syphilis, which had the additional complication of Rh incompatibility of the parents.

COMPLICATED PREGNANCIES WITH PREMATURE DELIVERIES

Sixteen women out of 1,015 had complicated pregnancies ending in premature deliveries. They accounted for 7 of the 20 fetal deaths and 5 of the 9 neonatal deaths. Three of the stillbirths occurred in women with toxemia and 3 in cases of uterine bleeding during the last trimester. One of these had fibromyomata uteri and pyelonephritis, in addition to a central placenta previa. It was found necessary to do a Porro Caesarean section on this woman because of massive hemorrhage. The seventh fetal death in a complicated pregnancy was associated with diabetes that was difficult to control. During pregnancy the woman went alternately from insulin shock to diabetic acidosis. Premature delivery of a stillbirth resulted.

THE MODE OF DELIVERY

The third table in our series sets forth the data on the mode of delivery of the 1,025 infants and compares the HIP experience with that of all obstetrical cases in New York City during 1948. Of all infants born alive or dead in the HIP experience, spontaneous deliveries were reported in 90 per cent of the cases, instrumental in 7.3 per cent, and operative interventions in 2.7 per cent. In the 1948 experience of the city as a whole with live births and fetal deaths occurring in the third trimester, 91.8 per cent of the deliveries are reported as spontaneous (including low forceps), 3.4 per cent as instrumental, and 4.7 per cent as operative cases. Of the 28 operative deliveries of HIP patients, 17 were for primiparas and 11 for multiparas. Of the latter, 7 had had operative deliveries in previous pregnancies. (See Figure 2.)

These findings on mode of delivery for the HIP cases are of special significance in the light of the ages of the women who were under HIP care. Had the HIP population been constituted as was that of the mothers in the general population of New York City, the rate of operative interferences, which was 40 per cent lower than that for the entire city, would in all probability have been still lower.

Table 4 sets forth the rates among

TABLE 3

Percentage Distribution by Mode of Delivery, All Infants Born Alive or Dead New York City, 1948, and HIP, Year Ended June 30, 1949

Line	Mode of Delivery	All Infants Born Alive or Dead: New York City [1] Number	New York City [1] Per cent	HIP, Year Ended June 30, 1949 Number	HIP, Year Ended June 30, 1949 Per cent
1	Total, lines 2, 8, 13, and 16	160,938 [2]	100.0	1,025	100.0
2	Total, lines 3–7 inclusive	147,768	91.8	922	90.0
3	No operative procedure	60,729	37.7		
4	Episiotomy only	34,951	21.7	903	88.1
5	Low forceps	49,016	30.5		
6	Version without forceps	328	0.2	0	0
7	Breech extraction without forceps	2,744	1.7	19	1.9
8	Total, lines 9–12 inclusive	5,425	3.4	75	7.3
9	Mid forceps	4,892	3.1	69	6.7
10	High forceps	63	—[3]	0	0
11	Version with forceps	27	—[3]	4	0.4
12	Breech extraction with forceps	443	0.3	2	0.2
13	Total, lines 14 and 15	7,603	4.7	28	2.7
14	Caesarean section, all types	6,873	4.3	27	2.6
15	All other operative procedures	730	0.4	1	0.1
16	Not stated	142	0.1	0	0

[1] Data from *Report of the Department of Health, 1941–1948*, City of New York, Tables 2 and 3, pp. 306–309.
[2] An additional 11,049 fetal deaths (apparently involving periods of gestation less than 28 weeks) reported the following modes of delivery: dilatation and curettage, therapeutic abortion, spontaneous abortion (dilatation and complete), illegal abortion, and ectopic gestation. The classification by period of gestation gives 3,065 as total fetal deaths after 27 weeks, 10,592 less than 28 weeks, and 361 — period not reported. This classification by mode of delivery infers that 2,969 cases reached the 28th week, leaving a discrepancy of only 96 infants between the two classifications.
[3] Less than 0.1 per cent.

TABLE 4

Rates for Operative and Instrumental Procedures by Age of Mother for Infants Delivered in New York City, 1947 and 1948, and by HIP Physicians, Year Ended June 30, 1949

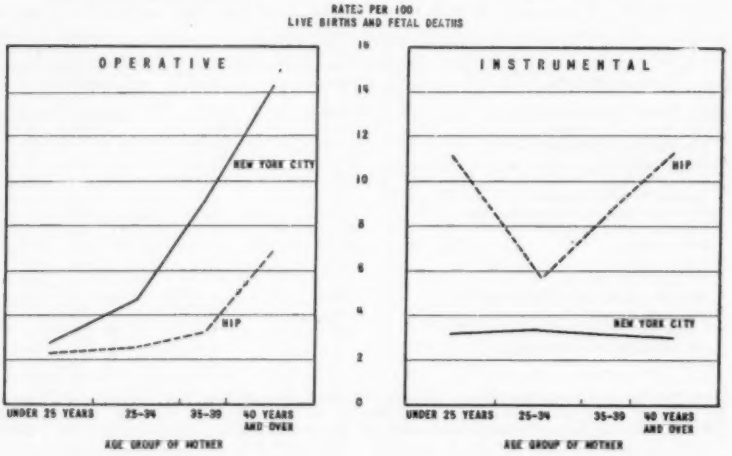
(Data for New York City Taken From *Report of Department of Health, 1941–1948*. City of New York: 1947 statistics from pp. 258–261, 1948 statistics from pp. 306–309.)

Age of Mother at Delivery	Rate, Infants with Specified Mode of Delivery per 100 Infants Born Alive or Dead: New York City 1947 [1]	New York City 1948 [2]	HIP [3]	Number of Infants Born Alive or Dead, with Specified Mode of Delivery: New York City 1947	New York City 1948	HIP
			Delivered Operatively			
All Ages	4.36	4.72	2.73	7,605 [4]	7,603 [5]	28
Under 25 years	2.43	2.69	2.21	1,354	1,459	3
25–34 years	4.30	4.77	2.47	4,160	4,158	16
35–39 years	8.73	9.20	3.19	1,573	1,486	6
40 years and over	14.05	14.22	6.82	517	498	3
			Delivered Instrumentally			
All ages	3.45	3.37	7.22	6,014 [4]	5,425	75 [4]
Under 25 years	2.97	3.25	11.03	1,653	1,762	15
25–34 years	3.73	3.48	5.86	3,608	3,027	38
35–39 years	3.56	3.27	8.51	642	528	16
40 years and over	2.99	3.08	11.36	110	108	5

[1] 1947 rates for New York City computed on basis of distribution of 174,230 infants born alive or dead and reaching 28 weeks or more.
[2] 1948 rates for New York City computed on basis of distribution of 161,034 infants born alive or dead and reaching 28 weeks or more.
[3] Rates for HIP, year ended June 30, 1949, computed on basis of distribution of 1,025 infants born alive or dead and reaching 28 weeks or more.
[4] One infant delivered with age of mother not reported.
[5] Two infants delivered with age of mother not reported.

FIGURE 2

RATES OF OPERATIVE AND INSTRUMENTAL PROCEDURES BY AGE OF MOTHER FOR CHILDREN DELIVERED IN NEW YORK CITY, 1948, AND BY HIP, YEAR ENDED JUNE 30, 1949



NOTE: Based on data set forth in Table 4.

the several age groups for operative and for instrumental deliveries in New York City in 1947 and 1948, for comparison with the HIP experience. In the general city experience the rate of operative interventions rises to 14 per cent among the older women, but no such rate characterizes the deliveries of older women in the HIP group. But again the numbers in the HIP experience are very small.

The comparatively low proportions of operative interventions at age levels over 25 years among the HIP patients are paralleled by relatively higher proportions of mid forceps deliveries at all age levels. The figures suggest that in some of the HIP cases the use of instruments to effect the delivery substituted for the resort to surgery.

FETAL DEATHS

The loss of twenty infants in fetal deaths represents a shade less than 2 per cent of the HIP infants reaching the third trimester of pregnancy. This rate approximates the general rate as reported for New York City in 1948, which was 1.9 per cent. Although all fetal deaths in the HIP group were reported, the same cannot be said for the cases reported to the city. In the EMIC experience (1943, 1944, 1945) it was found that 14 per cent of the fetal deaths in the third trimester were not reported to the Health Department. Therefore, the HIP rate may have been less than that for the city as a whole.

NEONATAL MORTALITY

Of the 1,005 babies born alive, only 9 died during the first months of life. This neonatal mortality rate is a little less than half that of the City of New York in 1947 and 1948. Of these cases 5 were premature births.

PRENATAL AND POSTPARTUM SERVICES

Of the women who were covered by HIP throughout the period of their

pregnancy, 70 per cent began their prenatal visits to the doctor at or before the third month of pregnancy and 94 per cent by the end of the fifth month. Thereafter, uncomplicated cases show the usual monthly visits through the eighth month and weekly visits thereafter. Complicated cases were treated as needed.

Laboratory services for the Rh factor, urinalyses at each prenatal visit, and hemoglobin tests are done routinely on all patients. X-ray examinations for pelvimetry and other purposes were made for cases not hospitalized, as seemed necessary to the physicians. One hundred cases were given x-ray examinations for pelvimetry or for other conditions.

In the complicated cases, all the modern diagnostic aids were available to the extent needed and, of course, without charge to the patient. In cases with heart disease, tuberculosis, diabetes, arthritis, etc., the obstetrician was free to call upon other specialists in the medical group for consultations and cooperative services.

Postnatal check-ups within a period of four to six weeks were routine practice, with full facilities for all further services that might be indicated.

SERVICES TO THE NEW-BORN

Children routinely come under the care of pediatricians during the first year, unless the family prefers the general physician, and in the case of many of the medical groups, the children remain under the pediatrician's care to the age of 13. Utilization studies have found that the monthly visit to the doctor is in full effect for HIP babies.

TEAMWORK MEDICINE

In HIP theory, teamwork medicine is at the service of the obstetrical patient as of all other patients, and we see that teamwork growing and developing. The pediatrician comes into active play immediately after the child's birth, as well as other specialists for both mother and child, with the family doctor seeing the whole family and its various needs. Guided by experts at HIP headquarters, the groups are moving toward better efforts in health education, including, of course, stress on nutrition and on the importance of even earlier inauguration of prenatal service. This, we believe, must form the basis of the modern health program, after impersonal environmental sanitary conditions have been brought under control.

CONCLUSION

A study of 1,015 deliveries of women provided with obstetrical services under the Health Insurance Plan of Greater New York during a 12 month period reveals the following:

1. The proportion of HIP primiparas, 35 to 39 years, was more than twice that reported for the City of New York, and those over 40 years were four times that proportion. HIP multiparas of 35 to 39 years of age were reported in almost twice the city proportion. as were those of 40 years and over.

2. In the HIP experience there were no maternal deaths.

3. The HIP ratio of fetal deaths in the third trimester of pregnancy to live births is approximately the same as among the younger women reported to the city.

4. Neonatal mortality (9 per 1,000 live births) was less than half that of the city as a whole (20.1 per 1,000) during approximately the same period.

5. Surgical intervention (Caesarean section) was reported in 2.7 per cent of the deliveries, compared with 4.7 per cent for the city generally.

In summary, it can be said that the present volume of HIP experience enables it to predict that on its present premiums it can provide obstetrical and pediatric care comparable to that given by the community's best medical re-

sources. As such care forms an integral part of comprehensive and well administered medical group practice dedicated to family service, it should in time considerably exceed in quality the services now generally available to New York City's population in the middle and lower income groups.

It should again be emphasized that the Health Insurance Plan of Greater New York is voluntary and is financially solvent. As an experiment in providing prepaid medical care through group practice of medicine, it is demonstrating its ability to furnish preventive as well as early diagnostic and curative services of truly comprehensive scope to an insured population without any financial deterrents to full utilization of physicians' services. In this report of its Division of Research and Statistics, the obstetrical experience of HIP is used as one of the many available yardsticks for measuring the adequacy of these services.

Discussion

BENJAMIN P. WATSON, M.D.

Professor Emeritus of Obstetrics and Gynecology, Columbia University College of Physicians, and President, New York Academy of Medicine, New York, N. Y.

DR. George Baehr has given us a very objective account of a year's work in obstetrics carried out under the auspices and direction of The Health Insurance Plan, one of the voluntary insurance plans at present in operation in the City of New York.

The essential element in this plan, commonly known as HIP, is that each center in a district is manned by a group of doctors representing all the branches of medicine, so that the patient enrolling under it can have the services of a general practitioner and of any specialist he or she may require in the center, in the office of the doctor, in her home, or in the hospital. It is a form of group practice. Dr. Baehr has explained how the doctors are chosen so as to insure the competence of each member of the team.

Thus the patient requiring obstetrical care can have a trained and certified obstetrician and he in turn can call upon the pediatrician to take care of the baby from the time of its birth, or upon any physician or surgeon in the group should their advice and services be necessary.

This free and unrestricted consultation is of obvious advantage to the patient and it gives to her all the advantages that our ward patients have in obstetrical units attached to general hospitals.

The advantages to the patient of this type of service are shown by the figures Dr. Baehr has presented which we all generally accept as reflecting the quality of obstetrical practice.

First, maternal mortality—none in over 1,000 deliveries.

Second, neonatal mortality—9 per 1,000 live births, as against 20.1 per 1,000 for the city as a whole, and this with a Caesarean rate of only 2.7 per cent, as against 4.7 per cent for the city, the low incidence of severe pregnancy toxemia, and the low incidence of fetal death when toxemia was present.

Dr. Baehr recognizes that valid deductions cannot be drawn from 1,000 cases, but the analysis so far made gives good grounds for hope that the same happy results will be achieved as the years go on and more and more patients take advantage of the scheme.

It must, of course, be borne in mind that practically all these patients were delivered in hospitals to which the obstetricians were attached, and some of the credit must be given to them. Prenatal care and supervision are, however, given by the doctors in their offices or at the centers. All will agree that this is a most important part of maternity practice and to it must be attributed the low incidence of severe toxemia and of general cardiac and other complications.

Obstetrics in a Primitive African Community

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IN a Congress of this nature—where modern methods and recent advances in obstetrics are being intensively discussed—it is perhaps salutary or even chastening to recall that large areas of the inhabited globe are still in the primitive state; and that in these areas the light of scientific medicine is just beginning to show the inhabitants the road to health and happiness. In few places has this development been so rapid as in British West Africa, but such development has of necessity been uneven and at this moment we can see every stage of progress between the primitive and the modern in relatively small area. It is the practice of obstetrics in that particular part of Africa and under those conditions that I hope to describe.

The area upon which I intend to concentrate is the British Crown Colony of the Gold Coast. It is situated just north of the equator in the center of that vast coast line previously denominated "the White Man's Grave." For Africa it is not a large territory, being about the size of the State of Montana, but within its borders are several physical and climatic variations and many tribes with varying degrees of development and culture. This area is of special interest to the inhabitants of the United States, since it was from this "Slave Coast" that the forebears of the Negro population of the North American continent were mainly derived.

Briefly, the Colony consists of a coastal plain, a central tropical rain forest, and a northern savannah belt which gradually and eventually merges into the arid Sahara. The inhabitants of the coastal area, having been in commercial contact with other nations for 500 years, are relatively the most advanced, while the tribes living in the north have similarly been affected by Mohammedan influence from across the desert. In the area between, the dense forest has isolated the people and maintained them in the relatively primitive state, and notwithstanding some notable exceptions, the people of this area may be regarded as those most strongly attached to primitive customs and practices.

As it is the obstetrical aspect which particularly interests us here, you may be interested in learning of customs and certain fetish or juju practices connected therewith and which are still current in this territory.

Marriage takes place early in life, usually between 13 and 18 years, the younger age being more common in the northern areas. Ellis [1] has recently investigated the age of onset of menstruation and has discovered that it is not as was commonly assumed—significantly lower in this area than in girls in Europe. Menstruation is generally regarded as unclean and menstruating women are debarred from fetish areas. In some coastal areas, the pubertal girl is decked with beads and ceremonially offered to the sea at the onset of menstruation, and similar rites pertain in other parts of the Colony.

In some West African tribes, es-

pecially in some areas of Ashanti and Fanti territory and in Nigeria, the bride-to-be is sent away to a "Fatting House," where her female relatives-in-law keep her in close confinement for several months during which time she is overfed in an endeavor to bring her to that state of obesity which among those particular tribes is regarded as a sign of extreme beauty and fitness for marriage. This, however, is not a universal custom in this part of Africa and, in fact, especially in the less sophisticated areas, economic necessity requires that she take her place in the husband's community as soon as she is able to wield the agricultural implements essential for the maintenance of the family land.

Polygamy is practically universal, but intricate and well defined orders of precedence in the household are recognized. In all but the poorest establishments each wife has her own hut or part of the compound, in which she cares for her own children, and in many cases the responsibility for the support of such children is hers alone. Many women, especially in the more populous areas, maintain flourishing businesses by trading in the markets. Sterility is regarded as a shameful thing and women go to great lengths to achieve pregnancy. Magical charms and native medicines in great variety are employed. Among the former, certain "fetishes" or "jujus" have a high reputation, and the barren women will visit there at definite times with an appropriate offering as fee for the custodian.

White cockerels, sheep, or goats play a big part in these secret rites, and subsequent pregnancy after such visits demands suitable thank-offerings. In some areas a barren woman is given to the fetish and should she subsequently become pregnant, the child also belongs to the fetish. In the Fanti area it is regarded as a gracious act for a recently delivered woman to place the placenta in the suitable place for barren women to urinate upon it. This is regarded as a particularly strong juju, and for the privilege it is usual for the mother to receive two or three pennies from the aspirant.

In some coastal tribes, barren women will carry about with them, concealed in their clothing, carved wooden dolls. These are not models of babies but of adult women with very prominent signs of fertility. Such dolls, if kept in close contact with the body, are supposed to influence similar developmental changes in the wearer. In parts of Togoland a pair of carved ivory figures representing man and wife are carried for the same purpose, as also are charms of various types.

Medicines made from herbs, roots, and parts of animals are in great demand and are sometimes supplied by the fetish for a fee. The organs of generation from animals and birds are often included in the medicine. These when taken by mouth, fortunately, have usually only a transitory effect upon the digestive tract, but those applied per vaginam often cause grave scarring and contraction to which I will later refer.

In addition to preparations of pepper, croton oil leaves, mangoes, and other vegetable substances, I have also seen caustic soda crystals used for this purpose, and the subsequent scarring and cicatrization and its influence on delivery should pregnancy occur can well be imagined.

Notwithstanding that there are a considerable number of taboos associated with pregnant women, the normal work in the compound or field is carried on, as it is commonly believed that hard work in pregnancy makes for a hardy infant. To prepare the pregnant woman and to "strengthen the child" much native medicine is consumed. This may be compounded of herbs and vegetable materials, but large quantities of well advertised household remedies put up by

trading firms are also purchased for this purpose in the towns.

The actual delivery is usually supervised by the girl's maternal grandmother and the remainder of the female relatives under her direction. Occasionally a male native herbalist may be requested to render assistance, and the fetish priest is consulted in cases of difficulty or danger. His aid is usually by means of drugs and douches, rarely by manual interference. Delivery takes place usually in a squatting position although among certain tribes the kneeling position is more common. Among those untouched by modern medicine I have never seen spontaneous delivery occur in either the lateral or dorsal position, and we might with profit ponder upon the effect of the kneeling or squatting position on change in pelvic shape and of the best use of the forces of expulsion.

In cases of slow or difficult labor, various methods are attempted to expedite delivery. The vagina may be lubricated with "shea butter," a natural fat from the shea tree (*Butyrospermum parkii*). Pressure upon the fundus by several onlookers has its advocates and in some cases actual jumping upon the pregnant abdomen is performed. All manner of charms and mixtures may be inserted into the birth canal, and I am not now astonished to discover fruits, berries, animal excrement, and other foreign objects in the fornices when examining cases of obstructed labor. The mixtures are not always put there as charms, but with the specific intention of causing a relaxation of the cervix. Unfortunately, many of the preparations used are extremely excoriating, and massive sloughing of cervix, vagina, and sometimes bladder eventually results from this cause. Extensive blistering of the labiae is also produced, and occasionally the fetal head is affected and a sloughing of the caput not infrequently occurs.

In the Kusasi area of the far north, obstructed labor is regarded as a sure sign of the unfaithfulness of the woman, and the unfortunate creature is subjected to three days cross-examination by the husband's family in an endeavor to extract a confession. It is believed that if this is given, the baby will then be born. After three days in labor and if no confession has been extracted, the woman is then taken to the fetish, where for two further days rites and sacrificial ceremonies are performed, and it is only after the fifth day that the woman, being considered incorrigible, is taken to the nearest government hospital, where usually a craniotomy and extraction relieve her sufferings and demonstrate the creation of a vesicovaginal fistula.

After delivery, the cord is divided by tearing or cutting but ligatures are rarely used except in those areas where this has been seen practised by trained midwives. The fetal end is sometimes covered with a styptic paste made of ground-up snail shell or cow dung which has been cooked in vegetable oil and is applied very hot.

During labor the parturient woman is often given a thick porridge made of cassava, corn, or millet. This is supposed to give her strength and to insure a firm contraction of the uterus after delivery. As these gruels consist largely of carbohydrates, the sustenance is probably of value, while the uterine contraction is symbolized by the ball of thick meal. A decoction of the roots of the neem tree (*Azadirachta indica*) is supposed to have a specific value in stopping postpartum hemorrhage, and for this purpose it is a very popular remedy with every tribe in this Colony.

Except in some remote areas, where they are put on the beach or left in the bush to die, twins are not regarded with disfavor. Twins of the same sex are preferred to those of differing sexes. It appears that since the boy will wish to follow his father fishing or hunting and the daughter her mother in the field and

compound, they will cause disharmony in the home, and twins, who should wish to be together, will be disunited by the traditional allegiance to the respective parents.

Twinning is common, and in the last year's figures at the Maternity Hospital, Accra, it occurred 25 times in 1,129 deliveries, i.e., about 1 in 45 deliveries, which is almost double the incidence given in American and English statistics. It is, however, very common for one or both twins to die. In the former case, women of certain coastal and Togoland tribes who have thus been bereaved have the custom of carrying a wooden doll representing the dead twin. This is based upon the belief that the evil influence which has killed the first may have its attention wholly occupied by the model and leave the survivor alone. To this end also, in some tribes, the mother and surviving twin are secretly removed to another village in the hope that the evil spirit will not be able to trace them there.

The new-born child is usually washed, but in many areas water is so scarce that this would be impracticable, and the vernix is removed with the aid of coconut or palm oil or shea butter. Immediately after parturition, the father of the child will have fetish rites to perform and later, usually on the eighth day, the new-born is exhibited to the relatives. This ceremony—known as the "outdooring"— is also the occasion upon which the name is bestowed, and in some tribes there is a definite name for male and female according to the day of the week upon which the birth took place. This ceremony differs according to the tribe and area but nearly always includes a libation made to the ancestral spirits by pouring gin upon the ground, an act performed upon all occasions of more than usual importance and not specifically related to the "outdooring" ceremony.

In some of the more remote areas there is a custom of applying a slab of clay or cow dung over the anterior fontanel of the baby's head soon after it is born to prevent evil spirits from entering the skull and causing convulsions. The slab is allowed to remain for several months. Tribal marks may be incised in the face of the infant during the first few days of life and are part of a complicated system whereby the child is permanently identifiable as a member of a specific family in a certain tribal group. In some areas, tribal marking is falling into disuse, since it is remembered that slaves were formerly branded and such marks are regarded as connoting inferior origin. Not all facial incisions, however, are necessarily of this nature, since in certain areas they are regarded as a specific against convulsions. They may also be made deliberately to disfigure a child, to make it unattractive to the evil spirits, and this is usually done if the previous baby had died soon after its birth.

Polydactyly is common, and together with other congenital deformities is regarded as due to misconduct of the mother, or to her having ridiculed a person similarly affected. In cases of congenital deformity some coastal tribes perform a complicated ceremony on the beach, where the child is laid down and requested to indicate whether it is animal or human. In the former case it is requested to disappear into the sea and trouble the family no more. The parents and interested relatives then hide, leaving the child with the fetish priest, who after an interval fires a gun to indicate that the decision has been taken and usually, upon their return, the child is missing. To be born with teeth is regarded as particularly undesirable and these are usually removed, as also are supernumerary digits.

Death of the mother undelivered is regarded with universal horror, and should it occur, the fetus is removed from the abdomen before burial. It is

widely believed that the child has malignantly destroyed its mother, and unless released from its prison the spirit will return into the uterus of another member of the family and again cause death. Certain remote tribes still destroy the surviving child of a woman dying in childbirth to punish it for having killed its mother, while in less primitive areas such children have certain taboos associated with them for the remainder of their lives.

Weaning is a long process which usually depends upon the interval before the next child is born. In any case, suckling at the breast usually continues for four or five years. From the age of a few months, however, food masticated by the mother is transferred directly from the mother's mouth to that of her infant.

I have observed a strange phenomenon where the grandmother of a child whose mother has died in childbirth or very soon afterward has been able, after a short interval of treatment with certain native herbs, to suckle her grandchild, notwithstanding that she herself may have had no child for many years. Since the preparation of this paper similar occurrences have been reported from French Equatorial Africa (Rutishauser[2]).

It is upon this background of primitive civilization that modern medicine has been introduced, but I should be doing the Gold Coast Colony a grave disservice if I permitted the impression that this Colony is still entirely an area of primordial savagery. This is of course not so, and those areas of the country where primitive peoples and customs do persist daily become smaller. The agencies responsible for this enlightening process—namely, rising economic standards, transportation, and education—are, however, precisely those which enable the people to seek modern medical assistance, and so for some time to come the hospitals in the towns will continue to have a certain number of patients from the more backward communities.

Perhaps here a few words concerning the position of the British Colonial Medical Service in this changing scene would not be out of place.

Although medical staff sailed in the vessels making trading and exploratory voyages to this coast from the 15th century onward, they were not permanently posted there until the late 18th century. Living in the trading posts established along the coast, their duty mainly consisted in attending the European staff and the slaves awaiting shipment. At the Congress of Berlin in 1885 the Colonial Powers accepted the principle of promoting the "moral and material well-being of the native population," but Gold Coast records show that a medical service for this purpose was already well established by that date.

Rapid trade developments opened up more of the hinterland at the same time that tropical medical science was taking shape; bringing therapeutics into direct contact with primitive peoples. But it was due to the introduction of organic arsenicals at the beginning of the present century that modern medicine was so largely accepted by these peoples. The dramatic response of yaws—an almost universal pestilence—to arsenic therapy at once established the confidence of the people in the medical service. So marked is this confidence that to the present day a doctor is regarded as very incompetent unless his scheme of therapeutics includes injection—preferably an extremely painful one.

From the beginning of the present century much pioneering work has been done by medical men in distant and isolated areas under great handicaps, and the establishment of bush hospitals has been steadily accomplished.

In 1928 the first hospital in the Gold Coast Colony entirely devoted to obstetrics was opened in Accra and it

is there that we can study with modern methods the problems of midwifery in primitive peoples under tropical conditions.

The response to modern obstetrics is directly related to the degree of contact with modern medicine as a whole, and this is in turn a measure of the degree of education in the respective areas. Antenatal care comes naturally to these women, since it has been the immemorial custom for them to consult the old women of the tribe, and the transition from grandmother to trained native midwife is not great. It is to be regretted that practically all the patients who now attend antenatal clinics regard them mainly as social gatherings with the opportunity of obtaining free or cheap medicine, and unless they feel unwell, little regard is usually paid to advice. The medicines still have a fetish quality and are taken with avidity. They do, however, provide the opportunity of treating anemias, chronic malaria, and helminthiasis. Having registered with the hospital as antenatal cases, the women invariably report if they become ill for any reason and thus our antenatal wards contain a large variety of conditions associated with but not necessarily related to pregnancy.

Admission to hospital requires persuasion unless the condition of the patient is grave or has already proved resistant to native therapy. Since its inception 21 years ago, the reputation of the Maternity Hospital in Accra has grown so much that cases now travel up to 100 miles or more for treatment. This hospital has more than 27,000 antenatal attendances and 2,500 admissions annually. It deals almost entirely with the complications of pregnancy and delivery; normal labor being usually conducted in the houses of the patients by native midwives trained in the Midwifery School attached to the Hospital.

What are our major problems? First of all, we have the ever present menace of malaria. In this hyperendemic area the importance of malaria to obstetrics is not easy to assess, since most of the adults have developed an immunity and the occasional attack of malignant tertian fever usually results in little upset or anxiety in the nonpregnant woman. The degree of hyperendemicity can be judged from a recent survey by Colbourne, Edington, and Hughes[3] in a village of 255 inhabitants in the vicinity of Accra in which malarial parasities were present in the peripheral blood of 31.7 per cent and the spleen was enlarged in 45.5 per cent. Of 913 patients admitted to the Maternity Hospital, Accra, last year for the treatment of a variety of pathological conditions associated with the antenatal period, 15.4 per cent were simple cases of clinical malaria; and in routine examination, of 6,925 consecutive admissions to the Maternity Hospital 27 per cent were found to have parasites in the peripheral blood (Russell[4]).

Over several years it has become apparent that malaria is probably the most potent cause of premature delivery—usually about the twenty-fourth week. It is also responsible for neonatal death in the first month of life and parasites have not infrequently been demonstrated in the new-born of the third day. Anemia associated with pregnancy is very prevalent, and my colleague Dr. Edington, of the Medical Research Institute, Accra, has recently shown that the most common type is the normocytic orthochromic, which accounts for 63 per cent of all cases of anemia investigated at the Maternity Hospital, Accra; and the macrocytic and microcytic, representing 26 per cent and 11 per cent, respectively.

Considerable efforts are made in our antenatal clinics to bring the hematological picture to normal before delivery, by disinfestation of helminths, treatment of malaria, and in severe cases by hospitalization for intensive therapy

based upon the hematological findings. The response to intensive iron therapy—in severe cases by the intravenous route—with the saccharated oxide, has in my experience been remarkable, even in the macrocytic group. The sickling trait is of course a characteristic of these people, and in a routine survey of 2,015 consecutive antenatal cases, 17.3 per cent sickled. It would appear that the majority of those so affected pass through life without any complication from this cause. In 2,577 admissions to the Hospital last year, only 3 cases of sudden death which could be attributed to the dramatic sickle cell crisis occurred. It was thought that the number of deaths among children of mothers possessing the trait might significantly exceed the number of deaths in children of mothers not so affected. Examination of the figures did not support this (Robinson [5]).

The obvious signs of malnutrition in women attending the antenatal clinics are few, and adult malnutrition is not marked in the coastal areas, although splenic with hepatic enlargement is relatively common. In the more prosperous areas such malnutrition is due to ignorance and persistence in dietary habits, rather than from poverty. In the village survey previously mentioned, the incidence of the dual enlargement of liver and spleen was greater in women than in men and the investigators considered that this might be due to a nutritional element in the presence of a constant physiological drain related to childbearing and lactation, as there was no significant difference in the incidence of malarial parasites in the peripheral blood of men and women.

There is no doubt that most infants suffer from lack of protein. Owing to animal trypanosomiasis there is little or no dairy produce and consequently the weaning of the child is a hazardous procedure. Almost every infant is weaned to starch foods derived from cassava, yam, or plantain and the classical picture of kwashiorkor disease (Williams [6, 7]) or minor degrees of this syndrome described by Waterlow [8] as "fatty liver disease of West Indies" are common.

With the notable exception of the Fulani—a nomadic tribe of Hamitic rather than Negro origin—the Gold Coast woman is short and small. By English standards the pelvis is very small, and although I am aware of the fallacies of method, external measurements have been recorded in the Maternity Hospital, Accra, for many years. They yield an average figure of 21.5 cm. for the intercristal distance; 19.2 cm. for the interspinous; and 16.8 cm. for the external conjugate. These measurements are 20 per cent less in each case than the figures usually accepted as average for English or white American women. The relative contraction in the Negro pelvis has been frequently recorded and I note that in recent American literature it is stated to occur in about 21 per cent of American Negro women, i.e., about four times as frequently as in white Americans. Stander comments in his book [9] that perhaps this is a sign of degeneration, and particularly in the colored races a manifestation of the imperfect physical development incident to living in large cities. I suggest that there is little doubt that, from its almost universal predominance in West African races, it is a racial characteristic and not generally due to malnutrition or racial degeneration.

So long ago as 1904, Riggs [10] recorded that while contracted pelvis occurred much more frequently in the black than in the white American woman, operative delivery in such cases was much more frequently required in the latter. This is our finding also, and most European visitors to Accra are impressed by the small size of the pelvis and astonished at the relative ease of delivery. Fortunately, our babies are small by English

or American standards, but there also seems little doubt that the Negro fetal head can withstand extreme degrees of molding more easily than can that of the white baby. It has been suggested that there is a hypocalcemia which is responsible, but no satisfactory evidence of this has yet been produced in the Gold Coast. The average weight of babies born last year in the Accra Maternity Hospital, where there is no evidence of gross malnutrition, was: male, 6 lb. 5 oz. (3,452 gm.) and females, 6 lb. 1 oz. (2,916 gm.); 3.7 per cent of babies were born below 3 lb. 8 oz. (1,740 gm.), and 23.4 per cent were born below 5 lb. 8 oz. (2,736 gm.). Notwithstanding their low birth weight, the new-born put on weight much more rapidly than do European children, and they usually double their birth weight between the thirteenth and twentieth week of life.

In a specialized hospital of this nature we do of course meet with much obstructed labor from extreme degrees of simple justa minor, but our problems in this sphere are largely with the funnel pelvis, where obstructed labor from this cause represents the commonest admission to our septic labor service.

Unfortunately practically all cases have been in labor for several days and, as I previously commented, have been subjected to native medicine by mouth, rectum, and per vaginam. Obstructed labor from all the other malpresentations occurs as might be expected. Stenosis of the cervix and vagina is a common cause of obstruction and even of ruptured uterus. This stenosis is almost invariably due to damage by native medicine applied per vaginam at a previous confinement or for sterility, which has resulted in extensive scarring and contraction of the soft parts. Only once have I observed obstruction due to the scarring resulting from female circumcision—this mutilation being rare in the Gold Coast, except in the most northerly areas.

Vesicovaginal fistulae are very common and unfortunately usually very extensive. Most of these prove irreparable from below, and if the anus is competent they are treated by transplantation of ureters into the sigmoid.

As might be assumed from the foregoing, the patients usually arrive at hospital in an exhausted and extremely toxic condition. In many the fetus is already dead and this simplifies the problem, as we can proceed to craniotomy and extraction. Last year in Accra we performed this operation 31 times in a total of 1,129 labors. The maternal mortality rate following this procedure was 6.4 per cent. Grave decisions have often to be made with reference to Caesarean section in these very septic cases where the baby is viable. Before the free use of antibiotics, my personal preference—in frankly septic cases where the membranes had been ruptured for more than 48 hours and native medicine freely applied—was for the extraperitoneal section, a method which proved in my hands a maternal mortality rate of 9.5 per cent; and a fetal mortality of 4.75 per cent; but now that penicillin is freely available, the lower segment operation is our method of choice and our maternal mortality rate for this operation in such cases is 3.1 per cent, the fetal mortality being 6 per cent. In this connection, a further series of extraperitoneal sections with the aid of antibiotics in these desperately infected cases is now in progress, and the results promise to be even better than this last figure.

We perform about 100 Caesarean sections yearly. It will be difficult for the reader to appreciate that all our surgical work has to be done without the lifesaving measure of blood transfusion. Apart from the primitive abhorrence in most of the peoples to the giving and taking of blood, the technical difficulties of maintaining a blood bank under pres-

ent conditions in the Colony have yet to be overcome. It is sometimes possible with the more educated to obtain donors from close personal relatives for planned operative procedures, but this facility is rarely available for emergencies and never in large quantities.

From the foregoing it will be evident that we who are working in West Africa are doing so under circumstances of some difficulty, and with disadvantages when compared with obstetricians in more normal surroundings. My colleagues and I derive deep satisfaction in overcoming such obstacles, but we are deeply conscious that modern hospitals and medical science can be of little avail in the reduction of neonatal and maternal mortality and morbidity until the great barriers of ignorance and superstition among the vast population are broken down.

Endemic disease, malnutrition, and all the other concomitant problems of our work can be conquered only by the spread of knowledge and it is by education, and by that means alone, that we can hope to achieve real progress.

In closing, I beg to remind you of the great debt that tropical medicine in general, and West Africa in particular, owes to that large body of men and women who during the last fifty years have labored to bring the benefits of medical science to the relief of suffering among those peoples; and especially to my predecessors, to whose devoted service in that particular field of obstetrics the Gold Coast Colony owes so much.

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DISCUSSION: Obstetrics in Indonesia

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IF I say a few words after hearing Dr. Goodman's paper, it is not to discuss things he told us, but to give some additional points about the 16 years I worked in Indonesia, then still named Dutch East Indies.

What did we know and what do we know about obstetrics in Indonesia?

We have to separate this into three periods.

1. In the beginning of this century it was generally thought that native people all over the world had a very easy childbirth and that women washed after delivery at the river and took up their work at once.

2. When a little more contact between native people and European physicians was made in obstetrics, this contact was made only in complicated cases.

3. Now we see in the large places also a great many women in obstetrical services with prenatal care, without complications, and we are able to tell something about differences between Europe and Indonesia.

Geographical pathology is important also for obstetrics. If we see differences in frequency between disease in different countries, with different races and different circumstances, this may be able to show us the way to more knowledge about the etiology of some diseases.

What was our task in Indonesia?

Indonesia has a population of 70,000-000, with a high birth rate, 40 per 1,000 in rural districts. There are ± 2,500,-000 births yearly, spread over a very large area. The medical ond obstetrical care was, and still is, little, if we make a comparison with the United States and Holland. In Indonesia were found before the war 1,200 physicians for 70,000,000; in Holland, 8,000 physicians for 10,000,000; and in the United States, 175,382 physicians for 140,000,000.

How did we try to provide better obstetrical care?

As conditions were so different from those in America and Holland, we had to do things in another way. Hospitalization for childbirth as is now available in New York for 99 per cent was economically and practically impossible for this country, and more than that, not necessary.

Import of physicians from Holland took place regularly, but this was not sufficient. One of the first rules of bringing good medical service to a nation is not to give presents only, such as hospitals and physicians, but to organize something the people can do themselves and can pay for themselves. It is the only way to assure a permanent function of the service.

Therefore, not only did Indonesians come to Holland to the universities, but since 1850 the Dutchmen organized medical teaching in Indonesia; in the last 20 years on the same level as in our country and also with postgraduate teaching for specialists.

There were also set up schools for midwives—a three year course, as in Holland—in which country, unlike the United States, the midwives conduct a large part of the normal deliveries. I think obstetrics is done in the best way if the work is divided by midwives and gynecologists. For the general practitioner, I do not see a place in obstetrics.

For such a large country as Indonesia it will be necessary to continue to use

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for many years also such-named persons as "help-midwives" and to give some teaching to such-named persons as "doekoens," women without any teaching who have only some experience. We do not have to think about these things in the United States and Holland.

The obstetrical department of our medical school conducted ± 4,000 deliveries a year. There are 7 prenatal clinics in different parts of the city; ± 3,300 of these births took place in the homes of the patients, 700 in the hospital because these were emergencies or very poor patients.

There are also two schools for midwives in the city of Dyaharta (formerly Batavia) working in the same way.

What did we see of obstetrics in Indonesia compared with obstetrics in Europe and the United States?

I agree with Dr. Goodman that the old saying, "The onset of menstruation in tropical countries should be earlier than in the colder parts of the world," is not my experience. We found the onset of menstruation in Java somewhat later than in Europe. The climate is not the only factor determining the date of menarche; there are many other environmental factors (nutritional, psychological) concerned.

The pelvis of the Indonesian woman is smaller, lighter than the European (the total stature and weight of the Indonesian woman is much less, most of them having a weight under 40 kilog. (± 80 lb.). It is important that while the transverse diameter of the pelvis of the Indonesian woman is much shorter than that of the European woman (11 cm. versus 13 cm.), the conjugate vera is nearly the same. The Indonesian pelvis inlet has an almost round form.

Pelvic contraction is rare in Indonesia, because rickets is extremely rare. In 4,000 deliveries a year I had to do only 1 or 2 Caesarean sections for pelvic contractions. This is an enormous advantage in a country with so little medical care.

The other side of the picture is that postpartum bleeding is a frequent cause of death (one-third of the maternal deaths).

Infection is rather rare. It is a happy thing that the unskilled help to the Indonesian woman in childbirth nearly never performs intravaginal manipulation, just as in Dr. Goodman's experience in his African community. We saw infected cases only where the duration of the birth was very long, or where the placenta was not detached a week after childbirth.

It is a remarkable historical fact that although this country formerly was not so advanced as to possess hospitals, never were there epidemics of fibris puerperalis as were known in Europe in the 19th century. Now that Indonesia has hospitals, we know how to prevent infection.

In pregnancy there is, even as without pregnancy, much *anemia,* but not as serious cases as reported in British India.

Syphilis was found in our obstetric service in 7 per cent.

Twin pregnancy in Indonesia is rarer (1:85) than in Europe (1:79).

When I came to Indonesia, I expected to see in this country, practically without prenatal care, a great many cases of *eclampsia.* I was surprised to find less than in Europe. In 1938 at the International Congress of Obstetrics and Gynecology at Amsterdam, I told the cause of this difference. The nutrition (very poor in Indonesia), the small amount of salt used, and also the large number of children (the larger part of the births are multiparous) have been mentioned.

Only 3 per cent of our pregnant women showed *albuminuria.*

Ectopic pregnancy with full-term child is not as uncommon as in Europe. In Holland it was seen once in the last 50 years; in Indonesia I saw a case nearly

every year. The patients gave a typical history. At the end of a normal pregnancy, they felt some contractions, had a little bleeding, and then labor stopped. They did not feel any movement of the child and came to see us after some weeks or months.

Thrombosis in Indonesian women is very rare and I did not see any emboli in 27,000 deliveries, 1,200 large operations, and 100 Caesarean sections. Neither did the head of the Surgical Department see any in many thousands of operations, nor the pathologist in 6,000 autopsies.

Puerperium—The native woman usually leaves her bed one day after childbirth. They will sometimes have, without medical care, a perineal rupture and yet I saw prolapse very seldom. In the hospital, we kept them in bed for five days and saw other women, with anemia, etc., who had to stay longer.

Concluding, I can say I have learned in Indonesia after my experience in Europe:

1. If good obstetrical (medical) care is offered, it is accepted, notwithstanding old customs.
2. A good medical (obstetrical) service is only possible if the nation does it itself and pays for it itself.
3. Good medical education is necessary in the country.
4. For obstetrical success environmental circumstances such as nutrition and cleanliness are the fundamentals.
5. Race differences are of lesser importance than environmental factors.
6. Geographical obstetrics can teach us a great deal of etiology.

JOINT SESSION FOR PUBLIC HEALTH, NURSING AND HOSPITAL ADMINISTRATION: RELATIONSHIP OF A HOSPITAL CONSULTATION PROGRAM TO THE PRACTICE OF OBSTETRICS AND PEDIATRICS.

Moderator: LEONA BAUMGARTNER, M.D., *Children's Bureau, Federal Security Agency, Washington, D.C. (1949–1950)*

Objectives and Methods of the New York City Hospital Consultation Program

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EACH year in New York City more than 150,000 infants are born alive. Ninety-nine per cent of these births occur in hospitals and judging by newspaper reports the remainder take place in taxicabs. There are in New York City at present only six licensed midwives. Childbirth in this city, therefore, unlike the situation in some other parts of the country or other parts of the world, is the domain of physicians and hospitals.

The physicians and hospitals of the community deserve a large share of credit in the tremendous lowering of maternal mortality which has occurred over the years. Yet in 1950 in the City of New York the largest cause of death of women in childbirth was hemorrhage. In our time women still bleed to death before they can receive adequate blood transfusion. They bleed to death not at home or in taxicabs but in hospitals. Because of this and other considerations we cannot permit ourselves to be satisfied with sacrificing one mother for each one thousand babies. The threshold of the "irreducible minimum" of maternal mortality must be lowered further and still further.

The practising physicians of the city, hospital administrators and staff as well as board members, sponsoring agencies, and others are working for the improvement of the quality of care given to mothers and new-born infants in hospitals.

In the following five brief presentations we should like to indicate how the Health Department works with these groups in the common effort to lower mortality and illness connected with childbirth. The Health Department, both under its broad powers and as detailed in the regulations of the Sanitary Code, has authority to regulate hospital maternity services. You will note that the term used in the topic of this discussion is "hospital consultation," not "hospital regulation." The chief emphasis of the hospital program of the Health Department is educational rather than punitive. It is true that the Sanitary Code does lay down certain minimum requirements below which no hospital maternity service is permitted to

fall. Even in these minimum requirements the community participated in setting up the original regulations and in making revisions. Just as the threshold of maternal mortality is lowered, so the community readiness to improve the quality of care tendered in all hospitals increases, and as the community moves, the minimum requirements of the Sanitary Code are revised upward. At the present time county medical societies, the New York Academy of Medicine, nursing and other professional groups, hospital associations, and others are participating in making recommendations for a complete revision of Section 110 of the Sanitary Code which relates to hospital maternity services.

The professional personnel in the Health Department working in the hospital consultation program includes two full-time and three part-time pediatricians, three part-time obstetricians, three full-time maternity nursing consultants and on a less frequent basis social workers, nutritionists, and sanitary engineers. The presence of part-time practising pediatricians and obstetricians on the consultant staff is a valuable feature. All the medical consultants are required to be diplomates of their respective specialty boards and to hold teaching and staff appointments at approved hospitals. They receive an extended preservice orientation to the work and additional training while on the job. Each participates actively in community and professional committee work related to maternity care.

One of the methods whereby consultation is given is by means of the hospital survey. A comprehensive survey of a hospital maternity service is made not merely by one individual but by a survey team which consists in each instance of an obstetrician, a pediatrician, and a nurse, and in some instances a sanitary engineer. Because of lack of budget funds a social worker has not yet been added to the team but, as mentioned before, her services and those of nutritionists are called upon by the team on occasion.

The survey, which is made by appointment, covers the antepartum and postpartum clinics, labor and delivery unit, postpartum service, all nurseries for new-born infants, formula suite, and the pediatric service if new-born infants are cared for there. In addition, certain accessory hospital services which relate to the care of maternity patients or new-born infants are also surveyed, such as the x-ray department, the laboratory service, and the dietetics, anesthesia, and social service departments. In all these areas of the hospital, the consultant team considers the physical setup, equipment, personnel, record keeping procedures and policies.

In the early period of the program most of the hospital surveys were made in the course of routine licensing, or in response to outbreaks of infectious disease, or to complaints received by the Health Department. With time, the consultant function of the department received increasing recognition, until more and more hospitals now request the service for the purpose of obtaining advice on use of federal funds under the Hospital Construction Act or, at times, of staff reorganization or policy change.

One or two stories may illustrate how an attitude of suspicion changes to one of trust and coöperation. One hospital experienced a number of minor outbreaks of epidemic diarrhea in the newborn nursery without serious consequence. However, a serious outbreak involving more than 85 infants and causing a number of deaths then occurred. After the immediate situation had been brought under control by the epidemiologists, the consultant team made a comprehensive survey of the hospital. When they pointed out the existence of overcrowding in the nursery, the necessity for individualized

techniques in infant care, the advisability of flexible segregation of infants in a suspect nursery, and the importance of adequate nursing service, quantitatively and qualitatively and under supervision, the hospital administrators recognized that the cost of instituting the changes recommended was a real economy in comparison with the effects of recurrent outbreaks, closing of nurseries, and hazard to patients.

In another hospital, a 19 year old woman died of eclampsia although she had been receiving antepartum health supervision in the outpatient clinic. Investigation indicated that the patient had missed one of her appointments and that no steps had been taken to discover the reason. When it was pointed out to the hospital authorities that a visiting nurse in the Health Department or one of the voluntary nursing agencies in the city could have visited the home of this patient upon request from the hospital, which might have helped to establish an earlier diagnosis and possibly have saved the life of this woman, the hospital instituted a plan of routine referral of all broken clinic appointments for home nursing service.

Following the hospital survey, the consultants meet to discuss their findings and to draw up a plan for making recommendation to the hospital. A detailed letter of findings and recommendations is then sent to the hospital, with copies directed separately to the superintendent of the hospital, the chief of the obstetric staff, the chief of the newborn service, and also the supervisor of nurses. Subsequently the consultant team holds a conference at the hospital with the above named hospital staff members, in addition to the nursing supervisors of the maternity and new-born services and the directors of the x-ray, laboratory, anesthesia, and social service departments. Where factors relating to the coördination of care between the hospital and the home are expected to arise, a representative of the visiting nurse service is likewise invited.

The presence at the conference of members of different professions and specialties and of representatives of different services in the hospital accomplish several results. In some instances, the conference brings together for the first time members of the different departments of the hospital, such as the administrator, the obstetrician, the pediatrician, the nurse, and the social worker. With the pressure of busy routine, it sometimes takes an outside agency to bring such persons together. The team consultants on their part derive benefit from obtaining a more balanced point of view between practical, administrative, or sometimes economic factors and the clinical features. Other hospital activities, too, tend to be drawn more closely together by the conference; such as medical services which function on a rotating basis for different parts of the year, outpatient clinic services with inpatient ward services, the laboratory, x-ray, blood bank, dietetic service, and so forth.

On numerous occasions the conference has resulted in interpreting to the hospital governing board or others responsible for overall policy or budget some of the needs of the institution. Hospital administrators and medical and nursing staff have found this feature extremely helpful. And, as indicated, the conference brings the hospital closer together with community resources and services outside the hospital, such as the Department of Welfare and other social agencies, the Maternity Center Association, blood banks, visiting nurse services, and others.

The staffs of each hospital have evidenced interest in the newer developments or practices of other institutions in the city. The consultant team has therefore been able to generalize such new developments and to act as a clearing house in this respect.

The surveys and postsurvey conferences do not constitute the entire method of consultation. Time does not permit describing the others in full detail. Suffice it to say that the consultation relationship is hopefully an on-going one rather than one of an episodic or periodic nature. Consultation is available on request in connection with planning new construction or any hospital changes which are under consideration. The Department advises on personnel standards and aids in recruiting personnel. In addition, special training programs have been established and hospitals are advised on methods of training individual candidates or staff members. Statistical studies are made for each institution and for the city at large. Each hospital is therefore able to make comparison between its own results and those of other institutions.

With the aid of the obstetric and pediatric advisory committees to the Department, the hospital consultation program has developed certain guides for hospitals, including the following: Recommended obstetric policies for hospital maternity services; prevention of prematurity and death from prematurity from the obstetric viewpoint; the management of asphyxia of the newborn; recommended standards for the care of the premature infant; a model infant daily record form for the nursery; suggested work manual for premature centers, and other material.

In presenting this general description of the hospital consultation program, one might be tempted to conclude with a listing of the many improvements which have taken place in hospital maternity services in recent years in this city. Credit would more properly be placed, however, if the improvement were recognized as an indication of close coöperation between various participants in the community. This spirit of cooperation is attested to by the fact that hospital requests for consultation now make it difficult for the Hospital Consultation Service to keep up with demand.

The Role of the Public Health Nursing Consultant in the Hospital Consultation Program

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THE public health nursing consultants function primarily in the following broad areas:

1. Evaluation of quality and quantity of nursing staff assigned to maternity and new-born services, and assistance in the strengthening of such staff.
2. Analysis of nursing procedures, policies, and techniques, with the purpose of simplification, whereby their effectiveness in patient care will be increased.
3. Assistance to the hospital staff in the development of an educational program for parents.
4. Promotion of a program of coördination of the care of maternity and new-born patients in the hospital and in the home.

Quality and Quantity of Nursing Staff

At the time of the survey of the maternity and new-born services of the hospital by the obstetric, pediatric, and nursing consultants, the director of nursing service of the hospital and the nursing consultant review the quality and quantity of nursing and auxiliary personnel which the hospital provides to give care to maternity and new-born patients. Assignment by type of service, type of personnel, and tour of duty throughout the 24 hour period is closely studied. The purpose of such joint discussion of the nursing care available is to compare accepted standards of nursing staff with that provided in the various units of the service: the antepartum clinic, the labor and delivery suite, the postpartum area, the clean, suspect, and isolation nurseries, the premature nursery, and the formula room.

It is not infrequently found that the postpartum service quantitatively has a larger complement of nurses than the new-born service, even though the majority of the former's patients may be ambulatory.

Similarly, it is found that the number of personnel assigned to the nursery service during the day may be considerably greater than that on the evening and night shifts, even though the care of new-born infants is essentially the same on all three tours of duty.

It is sometimes found that no specific nursing staff is assigned to care for the patient in labor. This lack of assignment leads to what is known as "pick-up" nursing staff, that is, during the patient's intrapartum period, a nurse may be withdrawn from any other hospital service and temporarily assigned to her care. In other instances, the degree of nursing assignment may be so lacking that constant nursing attendance is not given the patient, who is likely to be under the influence of analgesic drugs. Of equal importance in nursing care is the support which the trained maternity nurse is able to give the maternity patient during labor. In reviewing the nursing staff as submitted by the hospital, the consultant is able to make clear inequalities of nursing care and to assist the hospital staff in planning a

better distribution of its nursing personnel.

While it is recognized that quantity of nursing staff is necessary to give adequate patient care, much greater emphasis is placed upon the quality of personnel, especially at the supervisory level. To support this point, the need for better nursing supervision is at times well illustrated by the deficiencies in patient care observed during the course of the survey.

Where it appears that the nursing staff is in need of additional experience, plans are made with the director of the nursing service to secure outside experience or training in various phases of maternity and new-born care in some of the leading teaching hospitals, not only in New York City but throughout the country as well. An obvious advantage of such outside experience is that it gives the nurses an opportunity to observe and participate in modern procedures and techniques. Our experience has been that the more experienced and mature the nurse, the more she benefits from such opportunity and the more she is able to transfer into her own situation upon return.

Analysis of Nursing Procedures and Techniques

At each survey, the public health nursing consultant studies the procedures and techniques used in the care of maternity and new-born patients. The ultimate purpose of such study is to assist the hospital in making the best use of the available nursing time for direct patient care. Nursing procedures and techniques are dependent upon many intrahospital factors—the physical setup, equipment, medical policies, and whether or not auxiliary assistance, such as aides and clerks, is provided. Sometimes it is found that nurses are performing many non-nursing functions, such as those found in the areas of laundry, housekeeping, and clerical duties; a more proper allocation of these functions to the appropriate department results in a release of more nursing hours for patient care.

At times the nursing consultant may, upon request, make a detailed study of the nursing procedures as they are being carried out at the hospital. Those most frequently found to be in need of strengthening are the establishment of an effective handwashing procedure in the areas of maternity and new-born care alike; promotion of the technique of individualized care of the infant in his bassinet; modernization of the techniques of breast care and perineal care to the point where the methods used will be easy for the patient to carry out in her own home upon discharge from the hospital; simplification of the method of recording essential data on each infant on a daily basis so that the method adopted will be complete and yet not composed of excessively repetitive and valueless information; elimination of such nonessential techniques as daily bathing, weighing, use of umbilical cord dressings and frequent taking of temperatures on normal, full-term newborn infants; and the use of a surgical aseptic technique in the delivery room.

Assistance in the Development of an Educational Program for Parents

One of the greatest opportunities which the hospital nursing staff has of rendering valuable service is in the teaching of parents during the antepartum and postpartum periods. Curiously enough, these opportunities are rarely used to their fullest advantage. It almost seems that many hospital nurses are so accustomed to performing routinized techniques and procedures that aptitudes of an educational nature may not be developed to their greatest potentiality.

Educational opportunities begin in the hospital antepartum clinic. The hospital nursing consultant is often able to

demonstrate the amount of skilled nursing time in the clinic which has been devoted to such duties as labeling laboratory specimens, acting as traffic regulator, "pulling" records, folding linens and other supplies, and washing gloves, to the detriment of a much needed program of individual and group counseling for patients in the clinic. It has been found that these activities may be competently performed by auxiliary nursing personnel under the supervision of a registered professional nurse, thus freeing the professional nursing staff for the more important activities in the field of patient education and care.

It is frequently pointed out by the consultant team that one of the prerequisites for an adequate teaching plan in an antepartum clinic is that there be space available for this purpose; such space consists of a conference room where the patient may confer with the nurse with some degree of privacy assured. The nursing consultant can help the nurse plan content and method of counseling so that the patient will be given assistance in understanding the physician's instructions, particularly with regard to diet, rest, personal hygiene, clothing, the need for continuing antepartum care, and the need for attendance at specialized clinics for a particular medical problem or complication. The nurse can do much to give the patient personal attention and assistance in accordance with her own individual needs. Here, too, is an opportunity for the nurse to stimulate the interest of the patient in desiring to breast-feed her infant after birth.

Again there are many subjects of a less personal nature which may be adequately handled by group counseling, such as the physiology of pregnancy, preparation for labor and delivery, breast care and feeding, care of the baby, and methods of making formula. The consultant can point out that when the group discussion method is used, it is not unusual for a patient to feel more secure as she realizes that other women have similar problems and questions. In this way, also, many of the old, persistent superstitions and fears about pregnancy and childbirth are dispelled.

The nursing consultant is similarly able to point out the teaching opportunities during the hospital postpartum period in such procedures as feeding and bathing the baby. In fact, the success of breast feeding is found to be greatly dependent upon attitudes of the nursing personnel, who are in constant contact with the patient throughout the patient's waking hours. It seems almost unnecessary to emphasize the need for correlating the teaching content in the antepartum clinic with that of the inpatient service.

The final function of the consultant nurse to be presented here is:

The Promotion of a Program of Coördination of Care in the Hospital and in the Home

Too often hospital personnel consider that their responsibility ends when the patient leaves the clinic room or when she is discharged from the inpatient service. This point of view overlooks the fact that the patient is still in need of some care and supervision after she has left the hospital or clinic. To afford such continuing care, the services of community public health nursing agencies may be made available. While ideally such service should be made available to all mothers and new-born infants, at this time it still appears that some selection for referral must be used. Some of the usually accepted criteria for selection suggested are: expectant mothers with incipient medical or obstetric complications, patients with social problems, premature infants, primiparous maternity patients, and infants with congenital malformations or birth injuries.

Obviously, the initiation of referral is

the function of hospital personnel, and it is the responsibility of such personnel to see that this referral is implemented. The nursing consultant is often able to assist the hospital desiring to initiate such a system by arranging the initial conference with the community service and by advising on methods of interagency referral and exchange of information.

The Role of the Hospital Consultation Program in the Prevention of Prematurity and the Deaths of Prematures

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FEW people will doubt that the purposes of good obstetric care are to maintain the mother in good health throughout pregnancy, to make childbirth as satisfactory an experience as possible, and to deliver a normal live baby. Fortunately, these purposes are realized in most cases. Where they are not realized, this responsibility may lie with the physician, with the patient, with extraneous factors, or, more likely, with various combinations of responsibility. Prematurity is an outstanding example of our failure to attain our purposes in the sense that premature babies are often stillborn, or, even when born alive, constitute the major problems of neonatal mortality. In this paper we intend to review briefly the role of the obstetrician in preventing prematurity or in handling most effectively the delivery of a premature baby, and to indicate how our Hospital Consultation Program stresses the importance of this role. To implement further this aspect of the program, the Maternity and Newborn Division, in collaboration with the Advisory Obstetric Council to the New York City Department of Health, has prepared a guide for hospitals called *The Prevention of Prematurity and Deaths from Prematurity from the Obstetric Viewpoint*.

It is a simple truism that a healthy woman is more likely to have a normal pregnancy and a healthy baby than a woman who is not in the best physical and mental condition. In other words, the first step in the prevention of a premature birth should be taken before pregnancy begins. The premarital examination is an excellent opportunity for finding and evaluating pathological conditions in the pelvis. The exact treatment of each case, as, for example, a retroverted uterus, is a matter of debate, but the mere recognition of the condition will enable us to deal more intelligently with its relation to a supervening pregnancy. In the case of general or systemic diseases, notably heart disease, efforts can be made to stabilize this and to treat a secondary anemia. The patient's eating habits should be ascertained at this time and should be corrected to conform with a diet based upon the recommendations of the National Research Council. These recommendations are basically the same for pregnancy, with the addition of protein, minerals, and vitamins. It has been found that patients are inclined to carry over their normal eating habits into pregnancy, and if these habits exhibit marked deficiencies, the efforts to correct such deficiencies during pregnancy constitute a major problem for the patient and her doctor. The premarital interview and examination may be used to give a woman an insight into the physiology of pregnancy. An informed patient is more likely to coöperate with

her physician to take such measures as will maintain the best of health throughout pregnancy.

Once conception has taken place, we move on to the next phase of supervision, which is antepartum or prenatal care. Antepartum care, as it applies to the prevention of prematurity, is essentially the same care which should be carried out for all patients. With the exception of syphilis and severe heart disease and the pelvic pathological lesions mentioned, we seldom find in early pregnancy any conditions which immediately suggest the possibility of a premature birth. Syphilis is today much less important a factor because of increased case finding and efficient treatment. Heart disease is still important and requires early diagnosis and treatment, preferably in consultation with a competent cardiologist. The pelvic lesions, if found only after conception, must be dealt with according to the best obstetrical judgment.

Later in pregnancy we encounter three conditions which are so frequently associated with premature birth, namely, placenta previa, premature separation of the placenta, and toxemia. Of these, the simplest to deal with is placenta previa, simplest because as its former name—unavoidable hemorrhage—indicates, it is purely a matter of treatment. Nevertheless, even though it cannot be prevented, the termination of a pregnancy complicated by placenta previa can be delayed by complete bed rest for the patient. It may be said here that objections on economic grounds to enforced bed rest for some weeks should be considered in the light of the heavy expense of good care for a premature baby.

Obviously, in any case of threatened or actual bleeding, provisions must be made for the prompt replacement of blood loss. This is necessary not only to safeguard the life of the mother but also to maintain adequate oxygen in the maternal and fetal circulation. The other important type of hemorrhage associated with prematurity is abruptio placenta, the premature separation of the normally implanted placenta, formerly known as accidental hemorrhage. The underlying cause of this accident is unknown. It is possibly due to vascular lesions in the decidua basalis and these lesions may be due to a state of toxemia. Although manifestations of toxemia such as albuminuria, hypertension, or other evidence of renal damage are not constant findings in abruptio, they are associated frequently enough to emphasize further the importance of preventing toxemia.

Of all the conditions associated with premature labor, toxemia is probably the most important. We do not know the cause of toxemia any more than we know the cause of the onset of labor. Inevitably, all these unknowns lead to a great deal of speculation and a resulting lack of rational approach. Furthermore, the association of toxemia and prematurity is not entirely a causal relationship. Very often premature labor is artificially induced as part of the treatment of a toxemic patient. But our conclusion is the same—in order effectively to reduce the incidence of prematurity, we must prevent the development of toxemia.

The many theories on the etiology of pregnancy toxemias have different points of departure and suggest the presence of many operative factors. Probably the most basic consideration is the importance of nutrition. Tompkins of Philadelphia goes so far as to state flatly that toxemia is a nutritional deficiency state and that this deficiency is due partly to emotional instability. He claims that he and his associates at the Nutrition Research Clinic have been able, by controlling diet and other aspects of nutrition, to reduce the incidence of prematurity in treated patients by 70 per cent over a group of control patients. The work of Ebbs, Tisdale,

and Scott in Canada and that of Burke and her associates in Boston suggests that dietary supplements such as proteins, vitamins, and minerals have reduced the incidence of toxemia and prematurity. The reports of really large groups come from England and Wales. The Peoples League of Health surveyed about 5,000 women in the London area, half of whom were given vitamins and minerals, the other half serving as controls. The incidence of prematurity was lower in the treated group. Balfour reported on 20,000 women in the distressed areas of England and Wales. The effect of dietary supplements upon the incidence of prematurity was not separately recorded but was included in figures on stillbirths and neonatal mortality. The decreased incidences in the treated patients were statistically significant, probably even more so when it is remembered that the patients were treated according to apparent need and were a less favored economic group than the controls. Though all this testimony may not prove that toxemia is caused by a lack of vitamins or minerals or protein or all three, it is too strongly suggestive of the significance of diet to be ignored.

In the course of the Hospital Consultation Program, we feel quite justified on the basis of the evidence at hand in stressing the need for supervising diet. This is an integral part of antepartum care in general, as well as a preventive measure against toxemia and prematurity. In presenting these facts to hospital medical personnel, the approach is upon a clinical basis. Some aspects of antepartum care lend themselves more to dramatic presentation. The case history of a patient who died from hemorrhage due to placenta previa is a vivid reminder to the hospital of the importance of having adequate blood on hand. The number of premature births does not carry the same impact. But when the chain of events is demonstrated—the patient who did not keep her appointments because she had to wait so long in a crowded clinic, who was not followed up because there was inefficient organization of records and no liasion with other agencies, who did not follow sensible eating habits because her dietary instruction was perfunctory and time was not available to answer her questions and to explain how she could achieve such a diet, who was finally admitted as an emergency with a severe preëclampsia and had to have her pregnancy terminated to get a live but premature baby—when this chain of events can be demonstrated, steps to remedy the multiple deficiencies will suggest themselves. Cause and effect will not always be shown so readily, but it is the importance to the well-being of the patient of all these and other related factors that we try to convey in our program.

When it comes to the delivery of a premature baby, we can point to the well recognized fact that the smaller baby is more susceptible to anoxia. On this basis, the use of analgesia must be reduced to the absolute minimum because these drugs pass into the fetal circulation, tending to cause delay in establishing respiration at birth. Anesthesia should be limited to local infiltration or pudendal block. It is known that inhalation anesthesia in effective concentration causes diminution of oxygen supply to the fetus, but it is not always appreciated that conduction anesthesia may achieve the same effect because of varying falls in blood pressure following administration. The baby should preferably be delivered by low forceps with a wide episiotomy to decrease the possibility of damage to the soft fetal skull from prolonged pressure on a resistant pelvic floor. It is probably helpful to delay the tying of the umbilical cord until it has ceased pulsating, and more oxygen-carrying blood cells may be added to the fetal circulation by

gentle stripping of the cord. During this procedure an assistant can gently aspirate mucus from the baby's mouth with a soft rubber catheter. A pediatrician should be present at the delivery of every premature baby, ready to take over from the obstetrician and assure the maintenance of a clear airway, oxygen, and warmth. This implies the provision in the delivery room of an incubator or heated crib, depending upon the estimated weight of the baby; a resuscitator; a suction apparatus; and an infant laryngoscope and tracheal catheter for the intubation of an anoxic baby.

Needless to say, all this equipment is valueless unless it can be intelligently used. And it is part of the aim of our program to work with hospitals toward implementing all these recommendations for preventing premature births and handling these births as well as possible when they occur.

Obstetric Aspects of the Hospital Consultation Program

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ONE hundred and six hospitals in New York City maintain maternity and new-born services, with correspondingly diverse standards of obstetric care. It is felt worthy to point out how the major causes of maternal mortality in the city are related to these divergent types of obstetric practice and how the obstetric consultants in the Hospital Consultation Program have attempted to elevate standards of practice where required.

HEMORRHAGE

The Consultation Program noted in its incipiency that there was a high correlation between hospitals, inadequate provisions for blood replacement to the obstetric patient, and the fact that hemorrhage is the major cause of maternal death in this city.[1, 2] Many hospitals had no integrated program for securing antepartum blood grouping and Rh determination of patients, nor were these procedures required on admission of the patient to the hospital in labor. Furthermore, there were but few hospitals conducting maternity services that had either a blood bank or a supply of blood of the various groupings and Rh types on the premises. In addition, laboratory facilities and technical personnel were ofttimes not available at all or were available only during the "daytime" hours, leaving the institution uncovered for laboratory services during the equally active and important "nighttime" hours.

These two facts together spelled inordinate delay in securing blood replacement for blood loss during labor, delivery, or the postpartum period. If the need for transfusion arose, the patient would first have to be typed and an Rh determination performed, the proper type of blood requisitioned from a blood bank outside the confines of the hospital; then, when secured, cross-matching would have to be effected, all under emergency conditions, and then the blood replacement would finally be made to the patient.

The above facts have been graphically portrayed to directors of the obstetric services and to hospital administrators at many hospitals in the course of the conferences held at the hospital on the letters of recommendations sent following completion of the hospital survey. The portrayal of these facts to the responsible people has served a truly educational function in that it has caused them to reëvaluate their own problems and revise their policies regarding blood replacement.

Thus a growing number of hospitals in the city now require antepartum blood grouping and Rh determination on all patients, and a record is made of these findings and noted on the patients' charts on admission to the hospital in labor. In addition, there is available blood on hand, together with qualified personnel, in the majority of hospitals for immediate use on the obstetric patient when the need arises.

ANESTHESIA

There has been observed a marked discrepancy between the quality of anesthesiology employed in the delivery room and that employed in the operating room of the same hospital. It appeared as though the obstetric service was the "poor relation," so to speak, and that the obstetric patient was given the poorest quality of anesthesia service—namely, that interns and other untrained personnel gave obstetric anesthesia; while in the operating room, for even the most minor procedure, qualified doctor or nurse anesthetists were employed. The educational recommendations of the Consultation Service have been to supply the same quality of trained anesthesia service to the obstetric patient as to the surgical patient, and this on a round-the-clock basis. It was pointed out at hospital conferences that anesthesia deaths have emerged in recent years as a significant cause of maternal mortality. The safety factor to the patient is enhanced greatly by having competent anesthesiologists administer terminal anesthesia to the obstetric patient.

INFECTION

In the pre-chemotherapeutic and antibiotic era, fear of infection and coincident stressing of rigid isolation for morbid patients in a maternity service was the *sine qua non* of care. Today, we realize that there are other and more important considerations concerning infection. We are suggesting to hospital personnel that the patient can be considered "isolated" when morbid if she labors in a single bed labor room and following delivery is cared for in a single bed postpartum room; that there should be no deterrent to such a patient's using the regular delivery room for delivery and to cleaning it up in the usual thorough way, thereby preventing the possibility of cross-infection to another patient.

It has been our experience that the maintenance by the hospital of elaborate and specific isolation units is a detriment to efficient and economical hospital function. First of all, these units lie idle most of the time—hospitals just do not place patients in these designated areas. Thus much needed floor and bed space is denied a hospital's maternity service that could be put to much more practical use for patient care. Furthermore, it is extremely difficult to staff such "isolated" isolation units 24 hours a day. Since such recommendations have been made to the interested obstetric and hospital authorities there has been considerable interest and acceptance of this thinking.

TOXEMIA AND CARDIOVASCULAR DISEASE

We have viewed the rising incidence of toxemias of pregnancy and cardiac complications contributing to maternal mortality with alarm, as has the obstetric profession as a whole.[2] We recognize that the rising incidence of maternal mortality from these two causes may be related to the deficit in ratio of medical personnel to patients in the average hospital's antepartum clinics. Since we accept adequate prenatal care as the keystone of prophylaxis against toxemia of pregnancy, we have found in some instances that there is a decided gap between recommended standards of care and the actualities of clinical practice.

The average antepartum clinic is carrying a heavy and ofttimes increasing patient load with a sparse complement of medical and nursing personnel. It was previously pointed out in "A Blueprint for Changing Concepts of Antepartum Care"[3] that the patient's best interests will be served by a keener understanding of the clinic problem. More attractive facilities within the hospital; greater assurance of patient privacy; more medical personnel in attendance to permit a more salutary patient-doctor ratio; the establishment

of the nursing personnel firmly in their role as educators rather than traffic regulators; and the amplified use of accessory nursing, clerical, laboratory, nutritionist, and public health nursing consultants within the clinic structure would make for better patient care. More attention could be paid to the early signs of vascular complications of pregnancy, such as weight gain, increasing hypertension, and urinary findings.

It is not uncommon to find in the average clinic, for example, that a pathologic urinalysis report is recorded a day or two after the patient has visited the clinic doctor and will not be due to see him again for three or four weeks. Similarly, we must avail ourselves of a better system of follow-up for broken appointments. This requires better liaison with the social service, visiting nurse services, and other community agencies which can augment the actual clinic contact by home visits when necessary, to ascertain important information regarding home conditions, better understanding of medical orders, and the actual carrying out of these orders by the patient in the home.

In this regard, the problem of cardiac disease complicating pregnancy is an example. We ofttimes feel secure in our medical minds by instructing the patient to observe a salt-free diet, get plenty of rest, and restrict fluid intake—and let it go at that. But does the patient actually know what a salt-free diet means? Has she the environmental ability to get plenty of rest with a household and children to care for without any domestic assistance? And finally, when perchance she fails to keep her clinic appointment, is she just negligent or is she at home in incipient decompensation, too ill to attend the clinic at her appointed time? We recognize the value of medical orders in maintaining cardiac reserve during pregnancy, but we must and should implement them with some more tangible aid to the patient. Likewise, we recognize the extreme value of prelabor hospitalization for rest and for study of the cardiac patient, particularly of those with rheumatic heart disease. Yet are we not perhaps to blame when perusal of hospital records reveals numerous instances of patients, known cardiacs, admitted *in extremis* in the last trimester of pregnancy and who perhaps die undelivered because of our inability to implement our own orders?

These facts, too, have been brought to the attention of the obstetricians and hospital administrators, and their cooperation within their own hospitals is slowly but inexorably changing this picture for the better.

There are two additional important avenues wherein the Consultation Service has been of assistance in raising standards of practice, though in a more obtuse way. It is assumed that the quality of the records within a hospital reflects in great part the quality of medical care rendered. Perusal of hospital records, both old and current, has revealed gross inadequacies, particularly in the recording of the antepartum course of the patient, admission history and physical examination, admission blood pressure and urinalysis, progress of labor, and write-up of delivery procedure and progress notes. By focusing attention on this aspect of hospital practice and responsibility, many hospital administrators and clinical directors have taken measures to insure the proper and complete recording of all pertinent and essential data on the patient's chart.

Finally, placing the responsibility of maternity care squarely on the shoulders of a competent and qualified director of obstetrics has eventuated in the creation of sound consultation policies; and in the delineation of the medical staff into those members who may do varying degrees of obstetric practice within the hospital, namely, into those doctors permitted to do only normal deliveries and

those doctors who are accorded major privileges for delivery. By this action, only seasoned judgment indicates operative procedure, making unnecessary procedures the rarity, and those operative procedures that are performed will be presumed to have been done by the most competent staff members, in the interest of greater patient safety.

In conclusion, it is hoped that this brief exposition has shown how intimately related are the goals of both the medical and the nursing and public health workers; that by their working in concert we can continue the downward trend in maternal mortality specifically and further improve the quality of maternity care in general.

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The Role of the Public Health Nursing Consultant in a Community Premature Program

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SINCE premature birth is the major cause of infant and neonatal mortality, New York City, like other cities and states, has developed a Premature Program, in which the nursing consultant has played an interesting and prominent role.

PREVENTION OF PREMATURITY

The role of the nurse in the antepartum period, as pointed up by Miss Beuchat, may be an important factor in the prevention of premature birth. In surveys of hospital antepartum clinics, the public health nursing consultant assists the clinic nursing personnel in methods of counseling expectant parents and in raising the level of antepartum care. Efforts are made to stimulate interest in the nutritional status of the pregnant woman.

STANDARDS OF PREMATURE CARE

Basic to any program are standards by which the necessary level of care may be achieved. A set of standards, entitled *Recommended Standards for the Care of Premature Infants*, was established with the advice of the Pediatric Committee to the Commissioner of Health of New York City. The nursing consultants worked with a Nursing Subcommittee to develop the nursing aspects of the standards. They also participated in the meetings of the Pediatric Advisory Committee to interpret to the pediatricians the nursing needs and implications.

IMMEDIATE CARE OF THE PREMATURE INFANT AFTER BIRTH

Obviously, the care of the premature infant begins from the moment of birth. This means that each hospital with a maternity service should be equipped and staffed to give the necessary immediate care to premature infants. As a part of the Hospital Consultation Program, the needs of the premature infant are given careful consideration when the delivery unit is surveyed by the team. Particular emphasis is placed on the necessity of each hospital's having in its delivery rooms sufficient incubators or heated cribs and oxygen, suction, and resuscitation equipment, with personnel trained in their use, available for all deliveries. From a long-range point of view, our objective is that each maternity hospital will have on its staff at least one nurse who has had advanced training in the care of the premature infant.

DEVELOPMENT OF PREMATURE CENTERS

The nursing consultants have participated in the development of special premature centers. During the planning stages, blueprints and lists of supplies and equipment were reviewed to assure the most efficient functional use of the premature center. Assistance was given in the planning of nursing staff to secure

the quality as well as quantity required for a given unit. Assistance was also given in obtaining opportunities for additional training of nursing personnel. Plans were worked out to take advantage of the best available training for the various levels of personnel. With the pediatric members of the division, a work manual was developed as a guide to hospital staffs to assist them in formulating policies and procedures within their own premature center. This manual of suggestions included such items as: Personnel, health status of personnel, physical facilities, standard procedures of premature infant care, therapeutic procedures, preparation for discharge from hospital and on-going medical and nursing supervision, and suggested allocation of duties for non-professional staff.

TRANSPORT SERVICE

The Transport Service has been functioning in New York City since November 1, 1948. We have transported 900 premature infants to date. This service is staffed by nurses assigned by the Bureau of Public Health Nursing. The nurses and nursing aspects of the Transport Service are under the supervision of the nursing consultants. Before the nurses are assigned to the Transport Service, the nursing consultants arrange for them to have special training in the care of the premature infant at New York Hospital, in addition to a general program of orientation to the service.

TRAINING OF HOSPITAL NURSING PERSONNEL

The importance of well trained nursing personnel early in the program led the nursing consultant to plan and urge a program of training for nurses responsible for and participating in the care of the premature infant. Hospitals throughout the country and in New York City have been used for work experience. Twenty-five hospital nurses have secured this additional experience. This is in addition to 50 trained in general newborn and premature care at Sloane Hospital for Women and Babies Hospital. Training of nurses, however, without similar training of the pediatricians, has limited value in the functioning of a premature center. Through the coöperation of the New York State Department of Health and U. S. Children's Bureau, a joint training program for pediatricians and nurses has been established at New York Hospital. Six supervising nurses of premature centers and one from our own staff have had the advantage of this formal training program.

Other opportunities have been provided to enrich the experience of hospital and public health nurses working with premature infants. Institutes have been held through joint planning with municipal and voluntary hospitals. Obstetricians, pediatricians, nurses, social workers, and nutritionists outstanding in their respective fields have participated in these institutes.

Observation of existing premature centers with problems and opportunity for securing help with individual problems from nurses working in such units have been made possible. A visit to one unit in which a supervising nurse had done a particularly good job under difficult circumstances was arranged for nurses planning new units in their respective hospitals. That this type of experience was helpful to them is best expressed by their comments following the visit:

1. "I learned a great deal from my visit here. I think Miss X has done a wonderful job with the material she had available to her. I hope to try to employ some of the things she has done."
2. "The close relationship between the pediatrician and nurse certainly aided in making the techniques clear and simple. It also keeps the surroundings pleasant to know that everyone is coöperating and is understanding the trials of setting up a new unit with improvised material."

3. "This visit has been of more value to me than a whole month I spent at Z Hospital because the problems are the same as mine and I have learned how Miss X coped with them successfully."

Our experience has shown that the more opportunities the nursing consultants can offer hospital nursing personnel for the enrichment of their experience, the better will be the nursing care of the prematures for whom they are responsible.

DEVELOPMENT OF TEACHING PROGRAM FOR PARENTS OF PREMATURE INFANTS

One of the functions of a premature center which needs greater emphasis is the responsibility which the center has in the teaching of parents while the premature infant is still in the hospital. The separation of the infant from his parents during his prolonged period of hospitalization contributes greatly to the anxiety and apprehension of the parents. To forestall this psychological handicap, the nursing consultants assist the staffs of premature centers in the development of a teaching program, within the center, to instruct parents in the care of their infant, and so aid in bridging the gap between hospital and home care.

COÖRDINATION OF THE CARE OF THE PREMATURE INFANT IN THE HOSPITAL AND IN THE HOME

It is important that the good care which the premature infant receives in the hospital be extended into the home. The pediatric and nursing consultants plan, in joint conferences with the hospital, medical, and nursing staffs and community public health nursing agencies, for a follow-up system. As a result of work with the nursing consultant of the Department of Hospitals, a plan for home follow-up before the infant is discharged from the hospital and a subsequent follow-up visit after he is discharged from the hospital has been established for all municipal hospitals. This plan has now been working successfully since December, 1948.

The experience of the nursing consultants in the development of a community premature program indicates that there remain a number of unanswered questions regarding nursing care. Some of these questions are:

1. When a hospital has an established premature center, is it necessary to have separate nursing supervision apart from that provided for the full-term or other infant nurseries?
2. What is the desirable ratio of professional and nonprofessional nursing staffs in a premature center?
3. Have we arrived at the final answer to the amount of nursing hours needed per premature infant for each 24 hour period?
4. What functions may be allocated with safety to nonprofessional nursing staff?
5. Is it possible to carry on group teaching for parents in the premature center or should it be done on an individualized basis?
6. Is it reasonable to expect that all maternity hospitals should be in a position to provide skilled nursing care for premature infants weighing more than 4½ lb. or should all premature infants be cared for in centers where such skilled nursing care is available?

The Role of the Pediatrician in the Hospital Consultation Program

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THE functions of the pediatrician in the Hospital Consultation Program may be divided into several areas for discussion purposes: (1) Appraisal of the quality and quantity of medical supervision and care of the newly born infant; (2) dissemination of information to hospital personnel regarding modern trends in the hospital care of new-born infants so that such care may be improved; (3) study of mortality and morbidity, with the application of the knowledge thus acquired to the individual hospital situation; (4) coöperative planning with the organized medical and pediatric groups. Each of these activities will be discussed briefly.

APPRAISAL OF THE QUALITY AND QUANTITY OF MEDICAL SUPERVISION AND CARE OF THE NEWLY BORN INFANT

In the final analysis, it is usually agreed that the quality of care of any patient directly parallels the quality of personnel giving such care. Emphasis has therefore been placed upon the desirability of each hospital's having a qualified pediatrician in charge of the new-born nursery service. At present, almost every maternity hospital has followed this desirable practice. The next desirable step is that the pediatrics director of the new-born service be given the responsibility and authority by the hospital to establish his own policies and procedures and to so supervise the new-born service that such established policies and procedures will be well carried out. Such policies usually include the neonatal conditions for which consultation with a qualified pediatrician is recommended, the care and isolation of new-born infants with infection or potential infection, the care of premature infants, and the like. While many hospitals have delegated such responsibility to the pediatrics director of the new-born service, such delegation does not exist in all maternity hospitals. In some hospitals, the pediatrician is an "on paper" appointee, with little or no responsibility or authority accorded him by the hospital as would be expected. There are likely to be more problems in the neonatal period in this category of hospital. Here the members of the Hospital Consultation Service may assist the pediatrics director greatly, in supporting him in the specific areas of care with which he is vitally concerned.

DISSEMINATION OF INFORMATION TO HOSPITAL PERSONNEL REGARDING MODERN TRENDS IN THE HOSPITAL CARE OF NEW-BORN INFANTS

The very fact that the members of the Hospital Consultation Program, including the pediatricians, survey all hospitals with maternity and new-born services in the city places the pediatricians in a particularly fortuitous position to observe widely divergent practices in the hospital care of new-born infants, some highly practical and desirable, others less so. Thus, the pediatric consultant is able to disseminate good practices

seen in some hospitals to other hospitals which may not have kept pace with more modern thinking.

For example, it was not uncommon several years ago to find in some hospitals that normal full-term infants were being weighed daily, sometimes even before and after each feeding; that all normal full-term infants had their temperature taken routinely every 4 hours; and that normal full-term infants were never taken to their mothers during the entire neonatal hospital course. This last policy was most undesirable from several points of view: (1) The mother never had an opportunity to become acquainted with her infant and never could learn how to hold and feed him during the period of hospital stay, and (2) the infants were fed in the nursery with propped bottles. Not only was an educational opportunity lost, but the propping of bottles may be conducive to the aspiration of formula and the development of an aspiration pneumonia.

On the other hand, some hospitals in the city for a number of years have realized the need to simplify or eliminate certain procedures and to institute others. Thus, the pediatric consultants were able to report to other hospitals what modern concepts and procedures are being developed. It is almost unnecessary to point out that the members of one hospital in a community are intensively interested in what other community hospitals are doing and that a friendly, competitive spirit is a great stimulus in making progress. So, too, some hospitals have been quite interested in the rooming-in type of mother and baby care which has been developed at the New Haven Hospital and the George Washington University Hospital. Two hospitals in New York City now have a rooming-in unit, and members of the Hospital Consultation Program were called upon to assist in planning them.

STUDY OF MORTALITY AND MORBIDITY

The major causes of neonatal mortality in New York City are premature birth, birth injury, congenital malformation, asphyxia, bronchopneumonia, and diarrhea, in that order. While there are important obstetric components in the causes of neonatal mortality, there are likewise pediatric factors.

The pediatric members of the Hospital Consultation Program place special emphasis on the care of premature infants in each maternity hospital where a premature infant is likely to be born, as part of the city-wide premature program. The various aspects of the total premature program are: (1) The development of desirable standards of hospital care, based on the cardinal principles of care of the premature infant; (2) the provision of facilities in every maternity hospital for the immediate care of the premature infant after birth; (3) the development of premature centers where specialized pediatric and nursing care is provided; (4) the operation of a transport service to transfer those small premature infants born in hospitals which are inadequately staffed and equipped to provide long-term care; (5) the training of pediatricians and nurses; (6) improvement in the number and quality of autopsies performed; (7) loan of incubators to hospitals; and (8) coördination of care in the hospital and in the home through a home follow-up program.

Another area where the pediatric consultant may play a role is in the study of the various aspects by which one outbreak of infection may have occurred in a new-born nursery service. Experience has demonstrated that there is some relationship between the occurrence of nursery infections and the following factors: (1) Overcrowding of nurseries, (2) inadequate nursing staff and nursing supervision, (3) lack of handwashing

facilities in the nursery proper and lack of an adequate handwashing procedure by physicians and nurses, (4) inadequate policies for the immediate removal of babies suspected of infection to the suspect or observation nursery, (5) inadequate policies for the immediate removal of babies with definite infection to the isolation nursery, (6) improper technique of formula preparation, and (7) lack of definite policies for periodic physical examination of nursery personnel, and a resultant failure to exclude those staff members who have a communicable disease.

COÖPERATIVE PLANNING WITH ORGANIZED MEDICAL AND PEDIATRIC GROUPS

The success of a hospital consultation program depends to a great extent upon the coöperation of the professional groups concerned—the medical profession in general, the obstetricians, the pediatricians, the hospital administrators, and the nursing profession. More broadly, the pediatric end has coöperated with special committees of the various county medical societies in the hospital distribution of the standards established by the Committee on Fetus and Newborn of the American Academy of Pediatrics. Recently, a study of a group of premature infants who died in one borough was completed jointly by the special committee of the County Medical Society and the pediatric consultants. One of the pediatricians is a member of a county medical society committee which holds open monthly educational meetings for the medical and nursing professions on various aspects of infant mortality.

JOINT SESSION FOR NURSING AND PUBLIC HEALTH: PREPARATION FOR MATERNITY NURSING.

Chairman: SISTER THEOPHANE, *Director of the Catholic Maternity Institute, Sante Fe, N. M.*

Basic Preparation in Obstetric Nursing

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AN authority in the area of general education has recently said, "Successful teaching is teaching that brings about effective learning." In a discussion of the basic preparation of the student in nursing for obstetrics, I believe that this statement provides a logical guide line and a tremendous challenge. What must any instructor do if her students are to learn well? The simplest answer to that question is that she must get results. What kind of results? What means may she use to determine whether the results are lasting, usable, and meaningful?

We are not concerned here with obstetric nursing as pure subject matter. We are concerned with it as a unit within the total curriculum that will prove to be a positive developmental influence in the growth of the student toward individual maturity and competence as a practitioner. The instructor may organize situations within the framework of the curriculum which will promote and foster the mental, emotional, and social development of the student. It is her responsibility to vitalize her unit in such a way that the subject matter sustains the interests of the student and directs her toward new outlooks, new insights, and toward new ways of thinking, acting, and feeling.

For example, it is necessary to teach the student the fundamentals of newborn care. This begins in the classroom but may soon be transferred to the mother-new-born situation in the hospital wards. Here the student is introduced to a new mother who has her five day old son by her bedside in his crib. Here, in a family-centered situation, the student has an opportunity to observe nursing care being given to the mother and new-born baby by the staff nurse. After such an observation, this student will have supervised practice with other mothers and babies. As she participates in these real life situations, she begins to understand the relationships between mothers and new-borns, their mutual dependence, and to recognize the needs inherent in their care. This kind of learning is fundamental in its significance and in the proper sequence for experiences that are to follow.

Contrast the opportunity for learning here with that available in the centralized nursing situation. Here the student is introduced to a room full of infants—say ten or twenty—the mothers are nowhere in sight, having been separated from their babies directly following delivery according to a hospital routine. The clock on the wall and a few crying babies say that it is feeding time. The other babies sleep soundly through these

signals. In the wards the mothers wait patiently for their babies. The new student puts an ill-fitting coverall over her uniform, wraps a turban around her head, puts on a mask; then she is directed to "help take the babies out." Soon all the babies are passed out to the waiting mothers. After the prescribed nursing time has elapsed, the ritual of collecting begins. There is little time for a mother's questions or for admiration or cuddling of her own baby. She has often been admonished to see that her baby nurses constantly for his allotted time, so this is her main concern. Back in the nursery the babies who express dissatisfaction with their meal are quieted in their cribs with sugar and water or formula. The mothers in the wards wait for their visitors with empty arms and without anticipation. What is in this for the new student beyond an alien and meaningless routine? It is a hospital-centered procedure and for the most part a bad learning episode which will in time pay no dividends.

The difference in these two situations cannot be resolved by the instructor in obstetrics alone—she would not desire this nor would it be her function. Rather the hospital administration and nursing service, in their interest in quality nursing for mothers and babies, would be partners in creating optimum learning situations for the graduate staff and the students assigned to the unit.

What do we expect the nurse to be able to do after she has completed the basic preparation in obstetrics? The overall good that we as instructors and supervisors have set for her may not agree with the plans she has made for herself. When we find this out, in the case of even one student who is nearing completion of her program, we should look again at our aims and hopes for our teaching.

Objectives in this area have been stated many times. I should like to mention three. These objectives may be realized in terms of the student's changing behavior as she adjusts to new and different situations. They should encourage quality thinking, emotional stability, and social competence and consciousness.

1. The student should have the essential understandings concerned with the psychology and physiology of reproduction and the theory of obstetric practice.

2. She should have an appreciative understanding of technical proficiency on a medical, nursing, and community level.

3. She should be directed toward the attainment of an obstetric conscience—to develop in herself positive attitudes and aptitudes in relation to family living and all its implications.

If our dissenting student has achieved these three goals with reasonable success but states that she would never choose to work with new babies or in an antepartal clinic, we should look carefully for the gaps in her preparation in obstetrics. Somewhere along the line her learning or her experience was unsatisfactory to her. Certainly we entertain no thoughts of a wholesale turning of young graduates to obstetrics, but we do hope that the learning experience was totally acceptable. This brings me to the point that neither the curriculum nor the subject matter, alone or together, framed in gilt-edged objectives, will insure learning that is lastingly useful or meaningful for the student. They are the tools in our system of education but not the sole means of learning.

Nurses like obstetrics. Not until very recently have I had any proof of this beyond experience impressions. A few weeks ago I met with 100 graduate nurses interested in Nursing Curriculum Construction. They were asked if they were satisfied with their preparation in obstetrics on the basic level. About 30 hands indicated the affirmative, but only 2 in the entire group indicated that they

would be happy with obstetric care under the same conditions in which they were prepared. The majority of these nurses have been active in hospitals and public health agencies for some time. They were an informed group. I believe that their opinion, though unpremeditated, reflected more discriminating values of obstetric care than those they had as students and young graduates.

Looking for more concrete evidence of nurses' interest in this area, the application forms of 534 staff nurses who had been employed at the New Haven Hospital for the five year period between 1945–1949 were reviewed. On each of these forms the applicant indicated in writing her number 1, 2, and 3 choices of service. These were tabulated —a total of 1,420 choices. Three hundred and forty-five (24.2 per cent) of these were for obstetrics. Some nurses specified obstetrics, others specified nursery only. The total of these, indicating that their first, second, or third choice was for obstetrics, represented 293 nurses (54.8 per cent), or nearly 55 per cent of the staff employed. Perhaps the old saying, "Maternity nursing is women's business," carries some meaning still.

Now we may consider principles, with examples that may lead to satisfactory learning experiences on the basic level. It is impossible for the instructor to provide an inexhaustible supply of gold nuggets of information, demonstration, and experience at each contact she has with the students. Every day she cannot reach a high peak of performance. But each day she can strive for increasing excellence and adequacy.

The methods, to name a few, that she may use to set up her learning experiences are as follows:

Lectures, with or without the use of a textbook. Many instructors prefer an exhaustive bibliography and assigned readings.
Demonstrations, usually confined to skills and procedures.
Directed observations.
Group discussions.
Individual conferences.
Projects.
Supervised experience.
Final placements or assignments to wards.

The principles that should be considered in relation to each of these methods, and should filter through their application whenever possible, might be considered in this order:

Is the context—or the setting for the job of learning—good?
Is it something she can work with?
Is it concrete? Does it call for active participation by the student?

In teaching the unit on labor, the presentation and position of the baby in the uterus and its relation to the pelvis must be understood in detail by the student if the progress, or lack of progress, in labor is to be observed. The textbooks handle this lightly. The student may memorize positions perfectly and may be completely unable to place the fetal doll in the demonstration pelvis in any of the vertex positions. If this material is taught in the classroom with a birth atlas, pelvis, and fetal doll and repeated return demonstrations by the student, only a small per cent will recognize similar positions on abdominal palpation of mothers in the antepartal clinics.

However, when the doctor and/or the nurse in clinic teaches the student to palpate an abdomen of a mother near term, the learning is spontaneous and satisfying. Later, when managing mothers in labor, this student determines a position and presentation. Her findings are checked by the doctor or nurse. In the delivery room, when her findings are verified at delivery, she has the satisfaction of knowing she was right and has faith in this new knowledge because it is her own.

The setting for this learning is good because it is concrete, it allows for experimentation and discovery, and it

engages her active participating purpose.

Is the learning episode, or experience, in the proper focus? Does it have form and order? When the students begin to examine the state of their hangnails or fidget in their chairs, try *not* to be impatient. There is some unfocalized teaching going on and the students recognize it when perhaps you do not.

Teaching the fundamentals of good antepartal care is dry, abstract material until a student is encouraged to tell the story of the antepartal care her older sister is receiving in another city. The role of the bony pelvis in labor does not seem too important until the student who was thrown from a horse three years ago begins to wonder about her chances for normal labor. Context generates a motive for learning. The proper focus activates it.

Meaningfulness of learning depends to an important extent upon the social setting in which it is done. The freedom with which students form themselves into groups reflects their social consciousness. When these groups present a plan for some special project or block of research in a subject of interest, they are exerting a dynamic as well as reasonable force. A few weeks ago one of the doctors lectured to the students on hemorrhage during pregnancy. He spoke at length on rupture of the uterus and its great risks for mother and baby. Within the week one of our mothers who was almost at term and scheduled for her third section had such an accident. On her way to the hairdresser to get a permanent, she felt some abdominal stirring while she was waiting for the bus. This continued, so she took a taxi to the hospital. Within an hour she was delivered by laparotomy of a living baby found outside the uterus in the abdominal cavity. Postoperatively, the mother and baby withstood the operation and delivery quite well. One of the students was called for this delivery. Following, there was a class discussion of this incident, led by the student, who presented the case and a short review of the literature of similar cases. Here there was unquestionable incentive for such a presentation. The coöperation of the group did not call for trick management of special methods. It was inherent in the interest in an experience shared by the entire class.

All about us we have overwhelming evidence that individuals differ from one another. So it is perfectly obvious that all learning is an individual matter, because each student must do her own learning. By the time the students reach the obstetric block in their total program, the instructor has a general idea of the quantitative and qualitative potential that each brings to the service. By the use of pretests, interviews, and observations, further individual differences will come to light. The matter of planning experiences for the student with the keen intellect and little manual dexterity oftentimes presents a problem. She leads the class in theory but is not able to finish her service assignments, even with supervision. This student might be encouraged to improve the quality of her practical work if encouraged by demonstration, example, and the help of others in her group, rather than urged to work more quickly at a greater number of tasks.

This type of student will do well with small assignments—the management of one mother through labor and delivery and the immediate postpartal period will give an opportunity for her to be goal-directed within a plan that she has made.

"In spite of the large number of college women who do not marry, there are more educated women who become mothers than there are in any other profession." Many of these educated women are completely baffled and anxious when presented with the problems of motherhood and family life. Is this because many of them have been more

adequately prepared to deal with abstract intellectual effort rather than subjective emotional experience? Any plan of developmental teaching has this aim for all learning that the student achieves—that it shall be a vital and constructive influence in her growth as a person toward mental, emotional, and social maturity. If the curriculum of the school of nursing reflects this philosophy, then the unit on obstetric nursing should do likewise.

Will her preparation in obstetric nursing prepare the nurse to give adequate, safe, and satisfying care to expectant couples and their new baby? Will it also provide a personal experience and self knowledge that will lead to a happy, wiser homemaker and community member? The instructor is not only teaching obstetrics, she is teaching a way of life. There is an importance beyond the attainment of the objectives of the curriculum. There is this effectiveness of a series of learnings arranged in time. The concepts of the reproductive function that the student brings with her when she begins her education in obstetrics color her classroom and hospital experience. Later, as a graduate and a potential mother, these accumulated concepts will determine the kind of practitioner or mother she is apt to be. Therefore, the instructor in the organization of her teaching must consider sequence in learning as she has considered focalization, socialization, and individualization.

To cover the field of obstetric nursing as I have suggested is a very difficult thing to do in 12 to 16 weeks. It is not impossible. If she has a definite idea of the outcomes that she would like to see resulting from her teaching, it will be easier for the instructor to plan her program. If she knows her subject matter and can present it in a setting of actual life concerns and actual life interest and problems, she should obtain results that are authentic, lasting, and usable. If she will remember that 99 out of 100 nurses would like to have a job in which they are indispensable to some doctor who is doing something that they believe in, she will find the task of developing these beliefs relatively simple.

Are We Preparing Public Health Nurses for Maternity Care?

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THE subject, "Are We Preparing Public Health Nurses for Maternity Care?" raises many challenging questions. For instance, do we all mean the same thing by the term "public health nurse," by "preparation for public health nursing," and by "maternity care"? Perhaps we do, but to many citizen groups, to quite a few employers, and to some nursing educators, a public health nurse is a nurse who wears a blue uniform and works outside a hospital!

The National Organization for Public Health Nursing has furnished the profession with recommended qualifications for public health nursing personnel to fill certain types of positions. For example, the staff nurse in a public health agency who is to work under direct supervision should have completed a year in an approved program of study in public health nursing previous to or within five years after appointment.[1] The approved programs of study [2] are of two kinds, those for graduate nurses leading to a bachelor's degree, which are at present offered in 34 universities, and those which are a part of basic collegiate programs, numbering five at present. Completion of an academic year in an approved program does not mean that the nurse has completed the major in public health nursing, as this usually requires at least one calendar year. However, for employment purposes, she is usually considered a public health nurse.

It seems necessary to have a definition of a public health nurse in order to consider present-day preparation realistically. The annual count [3] of nurses employed in public health for the year 1949 revealed that only one-third (32.8 per cent) had completed one or more years in an approved program of study in public health nursing. This is a situation which cannot be ignored as we explore the question, "Are We Preparing Public Health Nurses for Maternity Care?" There is something rather jolting in the realization that forty years after the first program of study in public health nursing began, only a third of the nurses working in the public health field have had the advantage of such preparation.

But what of a definition of maternity care? Do we all mean the same thing when we speak of that? Beginning with the care of women only during labor and delivery, maternity care has expanded throughout the years. In its broadest sense it now includes premarital counseling and everything that contributes to safeguarding the health of women throughout the childbearing period. Does our education of public health nurses give them the preparation they need to fit into this concept of maternity care and to make a worthwhile contribution to the needs of maternity patients and their families?

A questionnaire to university programs of study seemed to be one way to find the answer. Two separate questionnaires evolved, one for the public health nursing programs of study for

graduate nurses and another for the five universities offering an approved basic curriculum. Twenty-five of the graduate nurse programs and three of the basic collegiate programs responded with varying degrees of completeness of data. The limitations of the questionnaire method in approaching such a problem were fully recognized and the inadequacy of merely listing courses which prepare the student for a specific service was appreciated. Questions were designed to determine the preparation provided through university courses and field experience in the general area of maternity as well as preparation to meet some specific public health nursing responsibilities.

In addition to the questionnaires, a study was made of the number of antepartal and postpartal nursing visits made by graduate nurse public health field students during one year at one university.

Relationship Between Basic Obstetrics and Preparation in Public Health Nursing—Approximately half of the graduate nurse programs replying stated that one or more pretests were given to all entering public health nursing students to determine the adequacy of their basic nursing education. Only one school used the test score as a basis for waiving any part of the usual content on maternity in the public health nursing program. Two schools indicated that students with low test scores in obstetrics were required to make up the deficiency. Eight schools used the National League of Nursing Education tests, four used the A.P.H.A. test and a few used special pretests. One difficulty mentioned was that tests had to be administered before the student entered school if the score was to be helpful in planning the course elections for the first semester.

Graduate nurses are admitted to programs of study in public health nursing from basic nursing programs which differ greatly in both theory and experience. In terms of length of experience, students usually have adequate or excessive time in the obstetrical service even when they have not had the recommended time in communicable disease or psychiatry.

Determining the quality of a student's obstetrical experience is more difficult. When a student replies to a question about her obstetrical preparation in terms of how many "scrubs" she had, one is left with the impression that patients as individuals did not exist very clearly for that student, but we may be wrong. The fact that the Board of Registration for Nurses in her state may have required a record of each student's obstetrical experience in terms of scrubs or direct assistance at deliveries may have been impressed upon the student, and she may believe she is defending the standards of her school.

Preparation for Public Health Nursing Responsibilities—The questionnaires sought information about courses which were designed to give the student preparation for certain public health nursing responsibilities in maternity care. No effort was made to list all responsibilities, and of those selected, some seemed basic and some might be termed "new" in terms of traditional aspects of care. Included in the responsibilities of the public health nurse were: Selection of antepartal and postpartal patients for nursing service, provision of continuity in nursing care, ability to contribute additional security to the patient and family during the maternity cycle, and leadership of classes for expectant mothers or parents. The questionnaire did not seek specific information regarding the student's understanding of community resources for marriage counseling, although it is known that some schools incorporate such content into maternity preparation.

Selection of Maternity Patients for Public Health Nursing Service—It would seem reasonable to assume that an

agency employing a prepared public health nurse should expect her to have an understanding of factors influencing selection of maternity patients for nursing service. She should know that her antepartal case load may be affected by such factors as the presence or absence of obstetricians serving the same area, by the kind and amount of nursing service available in physicians' offices, by the presence or absence of other public health nursing agencies, by availability of expectant parents classes, or by agency policy limiting her case load to primiparas or to patients having home deliveries. Where does she obtain preparation for selecting maternity patients? According to the questionnaire replies, graduate nurse students received such preparation mainly in courses such as those on maternal and child health, principles of public health nursing, and special fields in public health nursing. One of the basic collegiate programs mentioned somewhat similar courses, and one stated, "In our clinic the nurse has no responsibility for the selection of patients."

The study of number and distribution of maternity visits made by field students at one university offers additional information on this point. Most of these students had a semester of field work divided equally between visiting nursing and rural or urban health departments. During the visiting nurse service, antepartal visits constituted 5 per cent of their total visits and postpartals 17 per cent, or a total of 22 per cent of student visits for maternity; while with official agencies, 5 per cent of their total visits were antepartals and 9 per cent postpartals—a total of 14 per cent of student visits for maternity. Analysis of the number of families served would provide an interesting comparison, for it should be remembered that in the visiting nurse service many postpartal patients were seen several times.

While student field experience in a training center usually reflects the type of program carried by the agency, recent field studies [4] have indicated that antepartal service does not have as high priority as certain other "newer" services. In some instances, supervising nurses in training centers have suggested that the agency make a greater effort to plan antepartal visits for students than seems possible for the agency at large. In evaluating the relationship between field experience and theory, field students from the university in question frequently commented, "We expected to have more experience with antepartal patients, since we spent so much time on it in class." However, the majority of questionnaire replies from both types of university programs indicated that students seemed to gain sufficient understanding of how maternity patients were selected for service even though the number of patients seen during field experience was limited.

Continuity—We hope that students have had opportunities throughout their clinical experience to see and participate in programs that provide continuity in nursing care for maternity patients. Reports from the field,[4] however, even in recent months, indicate that some of the machinery for referrals is rusty and that it takes constant effort on the part of nurses, administrators, social workers, and physicians, in and out of the hospital, to see that continuity in patient care becomes a reality. Questionnaire returns from the courses for graduate nurses indicated that the same three basic courses were thought to contribute to the students' ability to arrange for continuity of nursing care. Field experience was rated as important in giving the student insight about how referrals work. The majority of these schools reported that students saw a successful referral system in action in the field agencies; some said that students participated in such referrals. All the basic collegiate programs reporting indicated

that their students saw an effective referral system in operation both in the hospital obstetrical service and in the field agency.

Ability To Contribute Additional Security to the Patient and Family—The employing agency should expect that a prepared public health nurse will have ability to contribute additional security to the patient and family during the maternity cycle. Because this is one of those vague generalizations which can mean everything or nothing in terms of what the nurse does, the questionnaire included some specific examples of both physical and emotional aspects of security. It is realized that clinic and hospital nurses also contribute to the same situations.

Assistance to the Patient and Family in Applying Principles of Good Nutrition—All the questionnaire replies indicated that students had a course in nutrition. By name, at least, the courses given in the basic collegiate programs seemed to emphasize diet therapy rather than normal family nutrition. It would seem significant to point out here that the American Dietetics Association [5] and the Committee on Professional Education of the American Public Health Association [6] have differentiated between diet therapists and public health nutritionists and that their preparation is somewhat different. Both would therefore have a contribution to make toward the education of public health nurses. A large majority of replies from both types of program indicated that during field experience students had opportunity to work with a public health nutrition consultant and to learn how to use such a resource person. Nurses should be familiar with the many studies now in progress in which a relationship between nutrition and the outcome of pregnancy is indicated.

In writing of New York City's premature care program recently, Dr. Wallace [7] said, "The biggest job is prevention of prematurity. Medical science already knows enough to prevent many premature births by the provision of good prenatal care, by teaching the facts of good nutrition to all mothers. We must apply this knowledge where it is needed." The public health nurse has a definite responsibility for giving important and sound nutrition information in such a way that patients and families can and will utilize it. The public health nutrition consultant can help the nurse with ways and means of translating scientific information into practice in everyday living.

Certain other examples of how a public health nurse could add to a family's security were defined as: Helping prepare the primipara for labor and delivery; helping mothers prepare for and practise breast feeding; interpreting rooming-in to expectant mothers. In general, both groups of students had courses in psychology, mental hygiene, maternal and child health, child growth and development, and social and health aspects of nursing or public health nursing services to prepare them to meet these responsibilities. During field experience a large majority of the graduate nurse students and all the basic collegiate students participated in at least one family care study centering around a maternity situation.

Replies from schools with basic collegiate programs indicated that their students received their major preparation for helping mothers get ready for labor and breast feeding in their basic obstetrical experience and that would seem to be where it belonged rather than in a course labeled "Public Health."

The foregoing sounds a little as though helping a mother prepare for and practise breast feeding was just a set of instructions, and it is far from that. The public health nurse is going to be asked questions such as, "Why should I nurse my baby when formulas are so safe today?" "Will I lose my figure—get

fat and out of shape?" "Do you know of a really good nursing brassiere—my sister had an awful time and finally weaned her baby." "Can I be a good mother and not nurse my baby?" The way the nurse meets these and other questions will probably be consistent with the way she meets other family situations. Will she try to understand what kind of people the maternity patient and her husband are, and why they feel as they do about a lot of things? Does she listen and evaluate, offering explanation skillfully and with no pressure, leaving the patient free to make her own decision? Or does she, in good faith, interject quite a few "shoulds" and "breast feeding is better because" into the conversation, so that the mother feels confused and even guilty?

Rooming-in and Natural Childbirth—According to the replies from graduate nurse programs, apparently all included some class discussion on rooming-in. All the basic collegiate schools replying stated that their students had experience in a rooming-in unit as part of obstetrics, although some units were described as of "modified type." Rooming-in, like breast feeding, is something that the public health nurse in the community is going to be asked about. After all, our patients read *Life, Look,* and the *Ladies Home Journal* and husbands read *Esquire,* and a common question is, "Why doesn't our local hospital provide such facilities?" What does the public health nurse say when she hears a comment that rooming-in is just a way of saving nursing time—does she know what studies or experience have shown? If mothers say, "But rooming-in is only for mothers of first babies, isn't it?" does she know the findings of studies which included multiparas? What about rooming-in versus the large nursery, so far as new-born epidemics are concerned? Do we have sufficient epidemiological evidence that large nurseries are unsafe, and is it right to give expectant parents that impression when that is the only facility available? This has been done!

Another example of how the public health nurse might give security was through assistance to mothers in preparation for "natural childbirth." This statement on the questionnaire read, "Assisting mothers in preparation for natural childbirth through demonstration of exercises and related teaching." Approximately three-fourths of the graduate nurse programs replying indicated that natural childbirth was discussed, and in some it was related to body mechanics but the exercises were not observed or demonstrated. Several schools stated that they hoped to develop this area further in the near future.

All the basic collegiate programs reporting indicated that their students were taught the Heardman exercises as preparation for assisting mothers with natural childbirth and had opportunitv to apply their understanding when caring for patients in labor.

Congenital Syphilis—The last example of a public health nursing contribution to patient and family security was concerned with assistance in the detection of acquired and congenital syphilis. This was included because of the present emphasis on prevention of congenital syphilis. The majority of the programs for graduate nurses indicated that such preparation was given both in a public health nursing course and in communicable disease control. Approximately one-fourth of these programs were offering a special course in venereal disease control. All the basic collegiate schools replying indicated that syphilis was included in obstetrical lectures by physicians and nurses, as well as in communicable disease lectures.

It is hard to determine from the replies how much awareness public health nursing students have of the status of syphilis control today. Do they regard syphilis as a rapidly declining threat

since the widespread use of penicillin? Or do they realize that the number of cases of congenital syphilis reported annually in the United States has remained constant for the past five years; and, most important, do they relate this knowledge to their care of maternity patients? That there are missed opportunities for detection and treatment of syphilis during the maternity period is brought out sharply in a recent report [8] which states that only one-fifth of the congenital syphilis reported is found in children under one year of age. Do our students know of the new Filter Paper Microscopic Test,[9] which may reduce the need to perform jugular punctures in infants and children—and do they realize that its use may have definite public health nursing implications?

Group Instruction—Reports from the field indicate a growing interest in group instruction for expectant mothers or parents and a great need for nurses who are better prepared to lead such groups. How do public health nurses achieve the balance of background between maternity content and group work methods which is necessary? All but three of the programs for graduate nurses indicated that they required a course in methods of teaching health, and in a few, opportunity for practice teaching was available. Approximately one-half of the replies stated that students had opportunity to observe mothers' classes during field experience, slightly less than one-third said that students participated in such classes, and two indicated that field students were conducting such classes.

No reports from the basic collegiate programs listed a course in teaching methods or group work, although one comment was made that methods of individual teaching were covered in the course—Social and Health Aspects of Nursing. While these reports indicated that students had good opportunity for observation, participation, and even a little independent work with groups, quite a bit of their group work experience seemed to be in outpatient clinic situations. Certainly we all have much to learn about how to prepare nurses to organize and lead a mother's class, and any group work experience with a permissive atmosphere should help. However, group work experience in even the best clinic situation would not seem to prepare the student adequately for working with a sponsoring community agency in promoting and organizing a mother's class, securing approval from a medical society or group of community physicians, and keeping up interest and attendance in competition with a large number of neighborhood and community activities. The clinic group is "ready-made" in a sense and while it supplies a certain type of good experience, the public health nursing student who is preparing to work in the community may benefit most from a community-sponsored class.

Amount of Preparation—One of the things attempted in the questionnaire for graduate nurse programs was to determine what preparation nurses received for maternity care in relation to the length of time they were in school. For instance, training divisions in state health departments are apt to send nurses to school for an academic year of preparation (two semesters or three quarters). A few states extend stipends to a calendar year, and this means that approximately three semesters or four quarters can be completed. What does the nurse get who is in school for one academic year—what is she prepared to do as compared to the nurse with three semesters or with a bachelor's degree? Do students who enroll in a program of study for only one academic year usually have field experience? Do they take the usual courses which prepare them to lead mothers' classes? The questionnaire failed to reveal this information.

My reason for digging so hard at an

answer to what we do for the nurse who comes to school for a year is that, despite wishful thinking, a year is still a common period for graduate nurses to study—especially if dependent on their own financial resources or on a state stipend. Granting that the future of nursing education lies in an integrated collegiate program, it is likely that public health nursing study will continue to be offered for some time to graduates of three year schools and collegiate schools lacking joint accreditation.

While recognizing that the preparation a student secures in maternity and other subjects in one year is far from adequate and that part of it may be "patchwork" or make-up of basic deficiencies, it would seem important that university programs continue an interest in this group of students during what has been termed an interim period in nursing education. Faculty, however, will need to continue constant interpretation as to differences in preparation between a two or three semester student and one completing the degree program.

For example, the degree student should be quite well grounded in maternity content, in psychology, mental hygiene, and teaching methods; she may have had electives in adult education and group dynamics. The student who has had two semesters of preparation, on the other hand, had had less content in maternity and often no direct preparation for leading an expectant parents' group.

According to desirable standards, she is not well prepared to practise public health nursing, and yet many states will testify that their one year stipend nurses are contributing a great deal toward rapidly expanding local health services—and perhaps more important—they are needed now. When we consider *how* we are preparing public health nurses for maternity care or for other services, we cannot help but be concerned that we prepare so few in relation to the number employed when the need is so great.

One other way in which nurses are prepared for maternity care is through inservice education courses planned by universities and state and local public health agencies. With joint planning of schedules, faculty members may be able to participate more generously in field institutes and workshops on maternity care. Such field meetings on the subject of maternity often have the advantage of bringing hospital and public health nurses together and focusing their combined interest on the patient—and that in itself can be a stimulating experience.

In conclusion, the questionnaire returns seemed to show a real effort on the part of universities offering both graduate nurse and basic collegiate programs to meet the needs of public health nurses in the maternity field. Data supplied and omitted served to raise questions as to the direction our teaching should take in the future. From even the limited evidence presented, the basic collegiate programs would seem to have the advantage in terms of good preparation in obstetrics presented in a dynamic situation. In some instances there seemed to be a need to emphasize community-centered rather than institution-centered experiences for these students. Certain strengths were apparent, too, in the maternity content of the graduate programs. These would appear to deserve careful scrutiny from the curriculum planners before sweeping changes are recommended.

It seems futile to argue which type of public health nursing program prepares the "best" maternity nurse when a more modest approach might indicate that there is room for study and improvement in all preparation today. Hope for the future would appear to lie in better basic obstetrics for every nurse—with an integrated curriculum rich in hospital and community experiences which will prepare the public health nurse of the

future to reach still higher levels of service to maternity patients and their families.

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The Training of Nursing Personnel For Maternity Service in England and Wales

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IN a report published by the Royal College of Obstetricians and Gynecologists in 1944, the aims of a maternity service were set out as follows:

> A maternity service should have three principal aims: The first is to bring the mothers safely through pregnancy, labor, and the puerperium. The second is to secure the birth of a healthy infant with the best possible endowment of its tissues to protect it against the diseases of childhood. The third is to leave the mother at the end of her lying-in period as well as she was when she became pregnant.

The fulfilment of these high aims and their ultimate value to the family and nation depends in no small part on the work and training of the British midwives. Midwives are present at more than 90 per cent of confinements and act as independent practitioners with full responsibility in 60 per cent of the cases in England and Wales.

In 1902 an Act was passed by Parliament to secure the better training of midwives and to regulate their practice, and a board was appointed to this end, namely The Central Midwives Board. Three other Acts have been passed since that time, the last in 1936, thus showing the understanding of the public about the value of improved midwifery services.

Midwifery training is in two parts:

Part I extends over a period of six months for State Registered Nurses, and over 18 consecutive months in all other cases. The prescribed course must be taken in a hospital approved by the C.M.B. The lecturers, teachers, and examiners must also be approved, hold the highest qualifications, and have had a wide experience of obstetrics. The pupil must attend—

1. At least 38 lectures, supplemented by practical demonstrations and tutorial classes.
2. Conduct antenatal examinations on not less than 50 pregnant women.
3. Witness 10 labors.
4. Conduct 10 labors.
5. Attend and nurse not less than 20 lying-in women and their children during the 14 days immediately following labor.

If the candidate passes her examinations at the end of this training, she may proceed to Part II of the course. This part extends over a period of six months and is mainly practical. During this time the pupil will:

1. Attend lectures on the social and legal responsibilities of a midwife.
2. Attend and take responsibility for the antenatal care of 20 women.
3. Attend and take responsibility for 20 women during labor, delivering the child and placenta.
4. Attend and nurse 20 women and their children during the 14 days following labor.

In addition, she will receive theoretical and practical instruction in the administration of nitrous gas analgesia; and will attend maternal and infant wel-

fare centers and venereal disease clinics.

The whole of Part II training may be taken on the district with an approved teacher, but the common practice is for only the last three months to be spent on the district.

Success in the examination, following Part II training, entitles the pupil midwife to be enrolled as a state Certified Midwife, and, provided that she notifies the Central Midwives Board and the local supervising authority of her intention to practise, she may do so.

The midwifery profession offers a wide field for service and promotion. After three years practice as a midwife (two years of which must be spent in a teaching hospital) the nurse may take a postgraduate course and prepare herself for the Examinations for a Midwife Teachers Diploma. There are many other opportunities offered as Matrons, Supervisors of Midwives, Domiciliary Midwives, Wards Sisters, and Maternity Nurses. Midwives may take specialized training in the care of the premature baby to be nursed either at home or in hospital, and one of the exciting new posts is that of Staff Midwife on the team known as the Obstetric Flying Squad.

Seventeen thousand midwives are practising today, helping to provide an efficient service to mothers during pregnancy, labor, and the lying-in period, as the published statistics show. The maternal death rate in 1949 was 0.86 per 1,000 total births.

The ultimate good of this training and service can best be judged by the mothers of the country; and by the obstetricians and gynecologists without whose help and teaching we could not function efficiently.

The Midwife's Part in Maternity Work and Her Training in Finland

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IN Finland, state registered midwives give midwifery care as well as doctors. State registered nurses without midwifery training have officially no part in it.

There are two laws concerning the maternity program, one governing the practice of midwives, the other dealing with health centers.

The work of midwives is directed by a chief midwife at the State Medical Board in Helsinki. The country is divided into provincial departments of health, each of which has a midwife superior who supervises the work of midwives in her area. The law requires that every rural county must employ one midwife per 5,000 population.

All preventive work is concentrated in health centers. Each midwife assists the doctor at his monthly clinic and holds her own weekly clinic. She visits the mothers at home regularly. About 90 per cent of all mothers receive prenatal care from midwives.

Midwives are responsible for all normal confinements, both in homes and hospitals. They must be able to judge when the help of a physician is necessary. Home confinements are conducted free of charge.

With the help of prenatal care, the majority of mothers likely to need hospitalization are recognized beforehand. If possible, primiparas are delivered in hospitals. Fifteen hundred beds are available in lying-in hospitals.

In 1947, 53 per cent of all deliveries took place in hospitals, 40 per cent were attended at home, and 7 per cent had no trained help.

In the majority of cases the midwife herself cares for the mother on the day after the confinement, or longer, if necessary. She has often long distances to go, via bicycle or skiing. We do not have cars for midwives. She must make arrangements—preferably beforehand—to have someone in the home who will care for mother and baby when she leaves. Some communities have visiting homekeepers who do this.

The course of training for midwives is two years. Graduate nurses are permitted to train in one year.

THE TRAINING OF MIDWIVES IN FINLAND

According to the Act of 1934, the State maintains a School of Midwifery in Helsinki, the capital of Finland. The Act provides that the training of midwives shall be supervised by the State Medical Board.

Entrance requirements: 19–30 years of age, good health, "public school" education (8 years of general education).

Length of the course: Two years, of which one month is for vacation.

The program includes: 1. During the preliminary period (3 first months)

a. *Lectures* in anatomy, pathology, bacteriology, psychology, personal hygiene, population politics, ethics and history of midwifery, nutrition,

child care, first aid, theory of nursing, pharmacology.

b. *Demonstrations and practice* in classroom and, in the latter part of this period, in the wards of the lying-in hospital of the School of Midwifery.

2. *After the preliminary course:*

a. *Lectures* in normal delivery and pregnancy, pathological delivery, puerperium, child care, maternity care and welfare, midwifery laws and acts, general hygiene, gynecology, venereal diseases, tuberculosis (preventive point of view), sex hygiene, social welfare, lectures about cases cared for in hospital, maternity gymnastics, theory of narcosis, techniques of the delivery and operating room.

b. Parallel with the theoretical teaching mentioned above, which is given during three terms of 3 months of length, the students have their *practical field work* in all special fields of midwifery as follows:

Maternity centers	2	months
Delivery room (Each student shall have 50–60 cases)	5	"
Child Welfare Office	1	"
Gynecological wards	2	"
Rural community (working with the supervising midwife)	2	"
Children's home (healthy children)	2	"
Lying-in hospitals (pre- and post-partum care, new borns)	6	"

Registered nurses and nurse students (during the last 8 months of their nursing education) can specialize in midwifery in 13 months, of which time they have one month vacation. They have two terms of theory, also parallel with the field work, and take all lectures of the later part of the general midwifery course except pharmacology and gynecology. The practical field work is as follows:

Maternity center	2	months
Delivery room	5	"
Rural community	2	"
Hospital wards (ante- and post-partum care, new-borns)	2	"

Special field work will be arranged according to the needs of the students.

JOINT SESSION FOR PUBLIC HEALTH, NURSING AND HOSPITAL ADMINISTRATION: WHAT AND HOW SHALL WE TEACH EXPECTANT PARENTS?

Chairman: ALICE V. KELIHER, PH.D., *Professor of Education, New York University, New York, N. Y.*

What and How Shall We Teach Expectant Parents?

THE POINT OF VIEW OF THE PEDIATRICIAN

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I SHOULD first like to say a word about the pediatrician himself. Immunization practices and the use of chemotherapy are freeing him more and more from the urgent demands of acute and overwhelming illnesses. His advice regarding children's behavior at all ages is sought by parents, who in turn are confused by the current onslaught of speeches, magazine articles, newspaper reports, radio and television programs on the do's and don'ts of rearing children. The pediatrician's growing need for a basic orientation in the field of normal emotional growth and development of children, so that he can guide these parents wisely, is well reflected in the new type of pediatric training in the teaching hospitals throughout the country, where the basic principles of normal emotional growth and development are being taught in a very concrete way as part of the routine training of the modern pediatrician.

Once the pediatrician has been oriented to this point of view, it becomes apparent that the best preparation for future parents in understanding and meeting the normal needs of their children should start long before their first visit to see him in the well baby clinic. His own interest in trying to get this parent-child relationship off to a good start is taking him into fields outside of the purely medical setting in which he would normally see his patient. These fields benefit, in turn, from his active participation and approval.

He sees clearly that as families in our present culture have tended to become smaller, the average adolescent girl of today has had little or no practical experience with young children. They are no longer able to practise on their mothers' babies as in former days. Too many prospective parents are having their first experience in handling an infant with their own first child. The pediatrician realizes that it is always easier to be more objective about someone else's child. For this reason he endorses heartily all efforts to teach and demonstrate what a child is like as part of the educational experience of every boy and girl. The growing tendency toward baby demonstration classes in high schools and the establishment of nursery schools in colleges are steps in this direction. So are the increasing number of fine films about children.

After these young people marry and become expectant parents, the pedia-

trician knows the most effective preparation can be done in the prenatal clinic. First of all, expectant mothers are an audience par excellence. The hopes and fears that are connected with pregnancy cancel out many previous variations in interests and backgrounds. The ideal group is small and informal, so that easy discussion is natural. In this setting no one makes a speech. It is a simple matter to encourage these future mothers to talk. My experience has been that each group invariably discusses certain subjects.

One is the appearance of an infant. Few of them have ever seen a new-born baby. Their idea is influenced by the advertisements, which invariably show a beautiful, plump one to two month old, cosmetically perfect. We have known mothers who have been so shocked at the first sight of their small, thin infants, that it took weeks of reassurance before they could accept the discrepancy between their mental picture of the child and the child in reality.

I need not point out the trouble the young mother stores up for herself if she has definitely made up her mind as to the sex of her child. In a group, it helps to take a tally on this point. They learn from each other the degree to which they have sold themselves this particular bill of goods.

Another point, which is always striking, is the amazing lack of understanding they have about their own bodies. One woman, who had had many prenatal examinations, hesitatingly said that she heard the doctors mention that "the vertex was floating." She and her husband could not find the word in the dictionary and she simply had to know whether it was good or bad.

Another typical example is concern about inverted nipples. That condition seems quite self-evident to us. However, in these discussions it is not at all uncommon for a young mother to say, "I want to nurse my baby but I know I can't do it if I have inverted nipples, and I don't know whether I have or not. What does it mean?"

The question of whether to breast feed or to bottle feed always comes up. It is interesting to see over the past several years the growing tendency of mothers who really want to nurse. I think it is important for the individual girl to make this decision for herself, in terms of what would make her more comfortable. There is no dobut that we, as medical people, can influence these expectant mothers in one direction or another. The basis of a good mother-child relationship is founded upon the procedure which is most comfortable and satisfying to the mother. If the mother really wants to nurse, it is our responsibility to encourage her. If, on the other hand, the mother for any reason does not want to nurse, I think it is equally our responsibility to permit her to bottle feed. To persuade a mother against her will to nurse when she wants to bottle feed, or to bottle feed when she wants to nurse, invariably creates needless tension in a feeding situation. The mother who wants to nurse but cannot because of a medical indication is in a different situation and can work through her disappointment with understanding and reassurance.

One further point I should like to make: The nursing mother needs to be told that a normal supply of milk takes a week or two to become established. The number of telephone calls that the Pediatric Department receives from nursing mothers a day or two after their discharge is incredible. It is all too easy, over the telephone, to tell such a mother that she had better give up breast feeding and use the bottle. The pediatrician, who is well oriented to an understanding of the emotional factors of a nursing couple, would never seek such an easy way out.

Another area that is of particular concern to the expectant parents is the plan

for extra help, after the mother's discharge from the hospital. Mothers who want someone to do the household duties, leaving them free to become acquainted with their new child, are becoming more numerous. The girl who feels anxiety and inadequacy in the care of the infant invariably says that she plans to have a trained nurse with her to take care of the baby for a few weeks. These mothers need extra encouragement throughout the pregnancy period so that they will not feel so overwhelmed by their own inexperience. So far as I know, the only way to get experience is to have experience.

I have said nothing about the father; unquestionably, the ideal prenatal clinic would include both parents. At the present time in most hospitals, classes for expectant fathers are held separately from the informal discussions with the mothers. The growing experience that we are having with various kinds of rooming-in plans clearly illustrates that dealing with both parents, jointly, has tremendous meaning and value in fostering a comfortable and successful family unit.

In conclusion, I should like to stress that the pediatrician who has had some part in preparing expectant parents to be comfortable and to enjoy their child reaps his reward in the establishment of an easy, smooth relationship between the child and his parents from the start. It is the function and privilege of the pediatricians of the well baby clinics and pediatric clinics, as well as of those in private practice, to continue to foster, guide, and support this basic relationship between a child and his parents throughout all the years of the child's growth and development.

What and How Shall We Teach Expectant Parents?

THE POINT OF VIEW OF THE NURSE

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TODAY'S parents are different! A generation ago expectant parents were patients—that is, they did what they were told and they let the doctor and nurse do to them what they thought best. But today's parents are not patients any more. They are eager to know every last scrap of information they can glean about pregnancy, labor, the baby, the doctor, the hospital, the why of every medical and nursing procedure, ad infinitum. They want to know these facts so that they can take part actively in the coming of their babies.

Many doctors and nurses resist this ebullient spirit. They dislike patients with a yen to know, patients who ask questions at every turn. Their questions may be stumpers. Some mothers and fathers want to be with each other during labor. Some want to learn to know the baby in the hospital and to participate in his care from the beginning. This means a radical modification of established hospital routines. The very place of the doctor and nurse in obstetrics is altered by these people who refuse to be patients. The mother and her baby assume the center of the stage instead of the doctor and the nurse with their specialized knowledge and life-saving techniques. When a mother wants to be the first to tell the doctor, "It's a boy," *that* is a revolution in obstetrics.

If you could see the disappointment on the faces of parents who have to be turned away at the Maternity Center Association's expectant parents' classes because of lack of room and staff, you would quickly sense how deep is this yearning for learning among the people who do not want to be patients. Never in life is there a greater readiness to learn than when the first baby is on the way. These young parents sense deeply the change that is coming into their family life. They know that new relationships are being formed which will be permanent and they are uncertain as to what these changes will mean to them.

I shall not dwell on all the facts which help to make real this purpose in the lives of young parents. I think we all agree that the dynamic story of human biology in its broadest sense is the chief focus of classes for expectant parents. These include the principles underlying all relationships in harmonious family living, facts about the importance of good nutritition and how to select and prepare the right foods according to individual needs, the facts about good hygiene, of selecting expert medical care, why the doctor's supervision is important to health, and why health of mind, body, and spirit is important in childbearing, facts about the human body and how it is constructed for reproduction, facts about the developing baby week by week and month by month.

I should like to dwell here upon one phase of teaching parents' classes—preparation for labor. There is no doubt in my mind, as I have taught parents at the Maternity Center in New York and at the Grace-New Haven Com-

munity Hospital, that the mothers who are prepared for labor have a more comfortable time, take an intelligently active part in the natural process of childbirth, and require less anesthesia and that their babies as a result are less subject to severe anoxia with all the resultant ill aftereffects. Perhaps most important of all, they truly enjoy having their babies.

What, then, is adequate preparation for labor?

Throughout the full nine months, parents-to-be are looking forward to the events of labor. What they expect depends to a great extent upon their experience in childhood and adolescence and upon their own days of courtship and marriage. These ideas may vary, from expectation of unbearable pain to sentimentally sweet nothings about pink-cheeked cherubs. Old wives' tales of countless generations may be woven into the vague memories from a college course in biology. The ideas of these parents are further molded during pregnancy by conversations at home with friends and relatives of the "Now, when I had my baby" variety; also by conversations in doctors' offices in which such frightening expressions as forceps, intravenous pit, and progesterone insufficiency, may be prominent. We cannot overlook these and other sources of information and opinion if we are to do a conscientious job of preparing parents for labor. Ever since Mariceau in the 17th century declared that pregnancy is a sickness of nine months duration, the shadow of disease and death has hovered over childbearing and the medical and nursing techniques and attitudes which have been centered on parturition. "Therefore," reasons any sane and sensible expectant mother, "if pregnancy is illness, then labor must be, too. Illness is uncomfortable and painful, therefore, labor must be, too."

In view of this multifarious information, of fact and pseudo fact boiled together into a doubtful pudding, one all-important fact needs to be made clear in teaching parents about labor. Childbearing is one of the normal functions of living. Labor is one event in childbearing. It is a natural process—the climax of many interdependent natural processes, ordained by biologic laws, perfectly timed in a marvelous sequence to culminate in the birth of a baby and the restoration of the mother's body after labor.

So the teacher starts with the assumption that childbearing is a normal function of the body, that babies develop naturally, perfecting their own bodies hour by hour and week by week, and that expelling the baby by muscle action when he is ready to be born is as natural as the continued regular muscle action of the heart and the periodic and regular contraction of the muscles in the colon.

As the facts about the naturalness of childbearing are discussed with expectant parents, you can actually see the expression on their faces change. The tense lines of fear relax. Fear—that most causative agent of tension and pain and illness—is chiefly generated by lack of knowledge. The unknown is a dark and gloomy jungle infested with the nightmares of imagination.

The doctor who examines a woman during pregnancy may not find a single sign of malfunction. The woman's body may be fit. But is she ready for labor? She may not be ready for labor if she and her husband lack the information about what happens moment by moment and stage by stage, what she can do to work with the normal forces of nature, and what she can expect her husband, the doctor, and the nurse to do to help her work.

There is a corollary to this, too. The doctor and nurse must know what happens normally during each stage of labor, so that they can work together in teaching the woman and her husband and in knowing when and how to help them during labor. The tragedy is that the

present generation of doctors and nurses has been raised upon the techniques of so blurring a laboring woman's sensibilities that the normal signs of progressing labor are blotted out. Very few can readily tell by the outward signs and symptoms of the mother's behavior when the first stage of labor is ending, when the transition period begins, when the second stage of labor begins, and when birth is imminent. Medicine used to know these facts but did not know how to help a woman over the humps. Now we know how to help her at each stage of labor and that help, to be effective, depends upon expectant parents knowing a great deal about all that is happening within the mother's body and what they can do. Therefore, we teach them what labor is and how it usually proceeds as one event in a progression which begins at conception and ends about six weeks after the baby comes or when lactation ceases.

The mother and father learn about the structure of the uterus, how it contracts and gradually softens, dilates, and retracts the cervix during the first stage, how it participates in the expulsion of the baby in the second stage. They learn, too, that the force of the uterine contractions alone is not strong enough to expel the baby. It requires the added force of the contracting abdominal muscles. They learn just how the mother can work with these natural forces and how the father, the nurse, and the doctor can help her.

This information releases much fear and tension within the minds of both parents, for they begin to understand that labor is truly coöperation with the forces of nature.

For centuries, mothers have traditionally been taught to expect that labor will be a crescendo of discomfort and pain, rising in intensity and frequency until at the dramatic climax, when the pain reaches an almost unbearable stage, the baby is born. Taking this supposition for granted, an uninformed mother in labor lives in continual fear and expectation that the next pain will be worse than the last and she blanches at the thought that three hours hence the pains will be beyond imagination. She is living, therefore, in a state of extreme terror, which causes extreme muscle tension. This results in more discomfort and pain. Is it any wonder that a woman clamors for anesthetic relief—not from the pain which she is experiencing at any particular moment but because of the pain which she expects in the future?

We now teach expectant parents that labor is not a crescendo of pain from beginning to end—that there usually is an increasing cramp-like sensation and backache during the latter part of the first stage which may grow severely painful during the 6 to 12 contractions of the transition period, when the cervix is being stretched to its utmost and the pushing reflex is not yet established, and that the pressure and stretching sensations as the second stage of labor progresses do not mean increasing pain under normal conditions.

In addition, the mother is taught a series of breathing, relaxing, working, and resting techniques and exercises.

Breathing—Because quiet, smooth, rhythmic deep breathing promotes relaxation, at the same time that it starts a full supply of oxygen on the way to all the mother's body tissues, she learns to breathe so as to expand her lungs slowly and gradually in all directions and to begin each rest and exercise period with a few such deep breaths.

She learns particular breathing techniques to use at particular times during pregnancy and labor because they help her to relax or work more efficiently at those times.

Relaxation—She learns to relax because in this day of hectic hurry and pressures of all sorts, few persons escape general or specific tensions. Few

know how to relax these tensions at will. Relaxation is rest. Tension is continuous work or muscular activity. A balance between the two is essential for all natural body functioning at its best—and so for childbearing. The mothers are taught to relax at will in the positions that are comfortable at the different periods of pregnancy and labor and to keep themselves relaxed so long as is necessary to rest or to facilitate the progress of labor.

Posture—To move, work, and rest comfortably, the mother learns to sit, stand, lie, walk, bend, lift, and carry with her body in good alignment to avoid strains and tensions and to promote physiologic functioning and efficiency. Rest positions that help to equalize the circulation in legs and pelvis during pregnancy, others that stretch the spine and lift the chest away from the pressure of the high uterus, are welcomed as tools to use when needed.

Exercises—Because abdominal muscles help to hold abdominal organs in good position, as well as because they are used during labor to help propel the baby into the world, the mother learns several exercises designed to contract them and relieve the stretching to which they are subjected so much of the time, so that they will not lose their elasticity and will be kept in condition to function well during labor and to serve the mother well after her baby comes.

One exercise is taught, to increase the elasticity and improve the tone of the pelvic floor muscles so that they will stretch more readily during labor and regain their tone afterward. One designed to stretch the perineum and promote the slight natural enlargement of the pelvis that facilitates labor; and one to stretch the leg adductors and internal rotators so that the position currently used in delivery rooms can be assumed more readily and with less discomfort are included, too; another to increase the mobility of the pelvis and lumbar vertebra, so that the mother can use her pelvis to better advantage during labor and carry her baby without strain or backache during pregnancy.

After mothers learn all the different procedures, they are taught just how, at the different stages of labor, they will combine a particular kind of breathing with a particular position or activity, or rest or relaxation, to promote comfort and progress. From this they gain great assurance and peace of mind. They feel they have at their own command a tool to use during labor, even if they are left alone.

Finally, fathers and mothers together attend an informal quiz and review class where all the events of labor are rehearsed in sequence and the role and behavior of father as well as of mother are related to what is happening in the baby's birth progress, and to what will be expected of them and what they can expect in the hospital.

The aftereffects of these exercises are seen when the mother begins to move about and care for her baby. For best results, the mother is taught which ones to continue for two or three months after the baby's birth and which ones to replace by stronger, more strenuous new ones.

The breathing, the relaxation, and the exercises are simple. They are easy to learn. They are done slowly, calmly, and smoothly so as to impose no strain. The pulse rate is not increased. In relaxation it is lowered. After the mothers learn the "feel" of each procedure, it takes repeated practice to learn to do each one with finesse. It takes real effort, too, to keep attention focused on breathing during relaxation. Daily practice, once the techniques are learned, promotes the mother's well-being during pregnancy and that is an additional though indirect preparation for labor. In fact, many husbands are quite pleased with the improved posture of their wives after they have learned

the exercises. No more walking like a duck! No more cumbersome movements! Grace is restored and with it a woman's confidence in herself.

One of the greatest causes of anxiety and tension during pregnancy is the father's and mother's fear that they will not recognize the beginning of labor. They imagine all sorts of things happening—their baby being born in a subway or in a taxicab, their doctor, in whom they have confidence, not being able to reach her. They do not want to be deceived by a false alarm. Parents are therefore taught how to recognize the subtle little signs of *approaching* labor, such as the settling of the baby into the pelvis, which results in easier breathing, less discomfort after meals, and some pressure on the lower bowel and bladder and large vessels; a sudden loss of as much as two pounds in weight three or four days before labor; an increase in the amount of cervical mucus; occasional firming of the uterus felt more often, a spurt of energy, increased pulse rate in the last 24 hours.

These parents are taught that no two labors are exactly alike, that a mother may have any or all of a number of signs and symptoms at the onset of labor. They know that labor may be a long slow process, since the cervix is usually opened *gradually* during the first stage and the baby is started slowly on his journey into the world. And that all takes time, except when contractions come hard and fast from the beginning. The parents are taught how to recognize a contraction—to put their hands on the mother's abdomen and feel her uterus grow firm as it contracts and rises against the abdominal wall and then grow soft again as it relaxes and rests. They know the contractions may come frequently or at long, irregular intervals, may increase in intensity, gradually, from the beginning, or may not. They may be uncomfortable and they may not. They may continue for some hours and then stop for a few hours, more or less. Parents are taught how to keep track of the time, duration, and character of the contractions from the beginning. The mother is taught to recognize the onset of labor as a new and different sensation, whether or not it is heralded by a bowel movement at an unusual time, the rupture of the membranes, the appearance of the "show," a considerable increase in the mucus secretion, or by strong or weak contractions that follow each other regularly or irregularly for some time.

The importance of reporting to the doctor or of going to the hospital is stressed, whether the mother is having specific symptoms of labor or just an unusual, vague feeling of uneasiness.

The parents learn, too, just what will be expected of them when labor is established—what route to use for the trip to the hospital, what to take with them, what entrance to use day or night, what the hospital admission routine is, what to expect in the way of examinations and preparation, and what to do themselves as labor progresses, how and when to relax, and how to breathe. They learn, as well, what they can expect from doctors and nurses in the way of help. Equally important, they learn what their emotional reactions are likely to be from time to time so that they can manage themselves and not get into a panic.

When mothers and fathers are prepared for the excitement which occurs at the onset of labor, they not only recognize it when it comes but also try to hold it within bounds. The trapped feeling which comes as the first stage really gets under way is frequent enough to merit mention in class. Extremely valuable is discussion of this phenomenon, together with the weariness and discouragement the mother may feel at about half dilation. Both may color all the mother's reactions, whether she is left alone or thrust into an occupied labor room.

When the mother and father learn of these mental and physical requirements of early labor, of the great importance of radiant good health, an alert and rested body and mind, good nutrition and good muscle tone, as well as a calm and contented spirit, they are motivated to study and work during pregnancy for this harmonius functioning of mind and body and spirit for the coming labor. They actually beg to make up any class they are forced to miss for any reason.

Most women in labor want someone with them upon whom they can depend for encouragement and guidance, answers to questions, explanations of procedures and their purposes, an interpretation of progress or lack of progress. The husband's presence in the labor room is important as he holds his wife's hand, rubs her back, reminds her at critical moments of what to do, how to do it, and she in turn feels his nearness. This contributes much to a state of complete relaxation.

In class we teach the signs of transition from first to second stage, stressing that few mothers experience all of them:

1. A lull in the contractions sometimes, before they come on stronger, longer, and more closely together.
2. An increasing or sudden backache, which may be quite severe.
3. A catch in the breath, a sigh, or a burp.
4. A sudden feeling of heat or chilliness, perhaps a shaking chill, nausea and a desire to vomit.
5. Hypersensitivity to touch, especially over the abdomen.
6. A sudden or increased pressure on the bowel.
7. Trembling or muscle cramps, especially in the calf, the thighs, or the buttocks.
8. Sudden inability to breathe abdominally.
9. Increased "show."
10. An involuntary contraction of the abdominal wall, with perhaps an equally involuntary grunt.
11. Beginning of amnesia between contractions.

The mother learns that her husband as well as the doctor and nurse can help her over this hump. At New Haven, I have seen some women who, with help, have successfully coped with the annoying discomforts of the transition period by using controlled breathing and relaxation, calmly gone to sleep between contractions, and wakened only when an active contraction is felt, to be keenly expectant and joyful as the baby is being born.

The parents are taught in class the physiology of the second stage expulsive mechanism. When they understand that their baby's progress through the lower birth canal is made possible by two forces working as a team—the contractions of the uterus and the mother's own voluntary pushing efforts—they begin to appreciate more fully the role which she is called upon to play. Instructions for pushing include description and gentle practice of what she will do. She learns to take a deep costal-sternal breath and hold it, to draw her legs up on either side of the baby and pull against them as she relaxes the muscles of the pelvic floor and adds to the expulsive pressure of the uterine contractions, the intra-abdominal pressure of her reflex, and voluntary efforts to contrast the diaphragm and abdominal wall.

If she can be helped to know in advance that this hard physical labor will be accompanied by a feeling of satisfying accomplishment and is relatively free from discomfort, she will look forward with enthusiasm and interest to the moment of full dilation, when she can begin to bring her baby into the world. She is taught that as her baby's head is emerging through the outlet, she will be called upon to pant in order to stop the abdominal pushing so that the obstetrician can control the delivery of the head, shoulders, and body of her baby. When she has confidence in her doctor and nurse, she will turn to them for coaching and be guided by them just as the athlete is guided through the big game. She will trust her doctor to give her sedative or light or complete anes-

thesia if and when she needs or wants that kind of help, under normal conditions, and will be ready to accept his decision about the best procedure to follow if at any time any difficulty arises.

The mother and father are taught what their baby will look like at birth so that they will have no romantic and unrealistic illusions to be shattered suddenly. The mother has learned, too, that her emotional reaction to this newborn baby of hers is reflected in the quality of the contractions which serve to separate and deliver the placenta in short order.

Throughout labor, the mother needs the expert care, insight, understanding, and obstetric acuity of delivery suite nurses and the obstetrician. When mother, father, and staff truly coöperate, there is a give and take to which each member of the team contributes and from which everyone benefits.

The second stage, after the difficult transition period, requires especially carefully integrated work from all concerned—the doctor, nurse, mother, and father.

Uppermost in the minds of all must be a sincere desire to afford both the mother and baby every advantage of good obstetrics, as well as to give to both parents every possible satisfaction in childbearing and to doctor and nurse the inspiration of having contributed to a safe and happy experience.

Then to birth comes a joy and exaltation which to many women is beyond description. As one mother recently wrote, "This is the most intense experience I suspect I shall ever have this side of death. It was certainly more exciting than getting married. It is the supreme time in one's existence if you really want a baby and if your labor is conducted half way properly."

To fulfill this demand of parents for information about childbearing; to teach expectant mothers the breathing and relaxation exercises; and to coach mothers through labor can best be done by qualified nurses. This is maternity nursing at its peak of usefulness. It is nursing, too, at its peak of satisfaction for the nurse herself, for she becomes an active member of the team, a professional person in her own right.

This responsibility, however, is a challenge to the educational background and community leadership of the nurse, for it requires nurses highly skilled not only in nursing techniques but in the basic knowledge of physiology, biology, nutrition, interpersonal and interfamily relationships, and community resources.

Shall we accept the challenge?

What and How Shall We Teach Expectant Parents?

THE POINT OF VIEW OF THE OBSTETRICIAN

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PARENTHOOD starts with the birth or adoption of an infant, but the background for motherhood or fatherhood begins in earliest childhood.

For convenience of discussion, training for parenthood may be divided into five fundamental periods: (1) Childhood, (2) adolescence and the premarital period, (3) prenatal and delivery period, (4) the immediate postpartum and hospitalization period, and (5) the home adjustment period.

While I shall devote my part of this discussion primarily to the prenatal delivery and hospitalization periods, there are certain professional responsibilities which the obstetrician and gynecologist must fulfill in all of these periods.

The obstetrician's first duty is to deliver the mother of a healthy infant free from the handicaps of anoxia and birth trauma. Mentally or physically impaired people have greater difficulties than the normal in all walks of life, including parenthood. Genital anomalies of the new-born infant which may influence future parenthood in any way should be discovered early and corrected as soon as possible. Proper childhood training in anatomic functions and sex development, respect for the family, and a happy home life are highly desirable background training for parenthood. This phase of early education is best brought about by guidance and example of the parents themselves.

Adolescence is a period of great growth, many physiologic changes, and marked emotional reactions. Proper direction through this period has a profound influence on marital adjustment and parenthood. It is highly important that the young girl receive intelligent preparation, as free as possible from unfounded beliefs, for the initial experience of menstruation. Menstruation should be approached with the natural pride of maturity. Instructions in hygiene and in the normal changes of adolescence should be a part of every young girl's and boy's life.

Complete premarital physical examination, with instruction regarding the structure of the genital organs, should be a part in the preparation of every young couple for marriage. Many of the early problems of marital adjustment can be eliminated by individual understanding of anatomical self.

A great amount of attention has been focused on the prenatal and delivery period of training for parenthood. As in all education, the closer one comes to the test, the more concentrated are the efforts to pass. So it is with many expectant parents. Information has real value when it can be applied to self. This is the period when prenatal pamphlets, various magazine articles describing all phases of childbirth, and physician and nurse instruction all have a strong influence on the expectant mother and father.

In order to know what to teach ex-

pectant parents, it is necessary that we have an understanding of the many mixed emotions associated with pregnancy. There is a wide individual variation in the reaction of patients to the knowledge that they are going to have a baby. Practically all women go through a mental panorama of certain fears and joys. They consider themselves too old or too young; the infant is wanted or unwanted, planned or unplanned, timely or untimely. Even in the woman who has a planned pregnancy, there are certain physiological changes which are new to her and about which she needs accurate information. Practically all patients review their personal past and have some apprehension about the unshapeliness, the pain, the difficulty of delivery, and the possible death or deformity of the infant. With unwanted or rejected pregnancies the whole triad of sex, shame, and insecurity plays a prominent part in the mother's reaction to her condition. Frustration, remorse, guilt, and sometimes even complete denial of pregnancy may form a part of her psychic reaction to motherhood. In our instruction to expectant parents it is important that we estimate the psychic reserve as well as the physical capacity of the patients.

In discussing prenatal education, I cannot refrain from mentioning some of the handicaps of our obstetric terminology. Physicians and nurses have been taught to use a group of words which are quite frightening to the average young woman. In our culture, in the development of midwifery and carrying over into modern obstetrics, we are still using such fright-provoking terms as labor pains, lacerations, shots, stitches, rupture, hemorrhage, vomiting, infection, lightening, abortions, and tears. To the young girl going into the process of producing her first child, I can think of no more traumatic middle-of-the-night conversation than to quiz her and her husband about the frequency and duration of "labor pains," the presence or absence of "hemorrhage," and whether or not the "bag of water has ruptured." We in the profession need to retrain ourselves in a terminology which carries with it less fear than that which we have used in the past.

Regardless of the source of information, every expectant mother should develop so far as possible a normal regard for pregnancy as a healthy physiological change with a goal objective rather than as a major pathologic disease. A vast majority of our young women today have no great difficulty with childbirth. With the trend toward less sedation, a wider choice of good anesthesia, an intelligent respect for complications, and with the proper use of operative procedures, blood transfusions, and antibacterial preparations, childbirth has been made safer than ever before in the history of the world. It is essential that the public know this. The time has come in obstetric practice when we can devote our thoughts to ***health*** rather than fix our attention on the prevention of maternal mortality, morbidity, and deformity.

Certain changes in obstetric practice have had a profound influence on the immediate postpartum period for many mothers. During the last decade, the demand for hospital delivery has more than doubled. Maternity services have been removed from homes and centralized in hospitals. Emphasis on specialization, better hospital standards, and freer consultation have improved the care of mothers and their new-born infants. The application of modern medical and surgical advances in obstetrics has made childbirth a safe and relatively comfortable process for practically all patients.

Only in the last four or five years have hospitals started to provide a homelike atmosphere for the mother and her new-born infant. Maternity hospital practices began with the ill mother.

Only those who were homeless or who were critically ill were brought to hospitals for delivery. Necessarily the babies were separated from the mothers. As hospitals became safer places in which to give birth to infants, the procedure of separating mother and infant persisted. Large dormitory-type nurseries with centralized nursing control have been provided for the new-born infants. Mothers have been kept in bed, with their infants brought in at scheduled hours. At the end of her period of hospitalization, the mother has left the hospital with a little individual whom she has met on scheduled, and frequently unpleasant, occasions. The father has had an occasional squint at an infant identified as his own. There is nothing natural about this type of maternity hospital care.

In planning maternity divisions of the future it is hoped that they can become centers of family education, particularly during those all-important first few days of parenthood. The infants should be treated as new patients entering the hospital by way of the delivery room. The family should have some choice in the hospital provisions for their new baby. This means a variety of nursery accommodations in reasonable proximity to the mother's room. Such an arrangement permits the mother to participate as much as she likes in the care of her own infant. Nurses become interested instructors for the mothers and fathers, showing them the fundamentals of caring for their new baby. Curtains should not be drawn over nursery windows. With the infants in clear view of staff and patients, better care will be given to the babies and an opportunity will be presented for everyone to know what goes on inside the nursery. Except at scheduled visiting periods, there is no reason why the infant should not be at the bedside of the mother as much of the time as she desires. By the time the mother is ready to leave the hospital, she will have a good understanding of her infant and the father, too, will have more than a fleeting acquaintance with his new son or daughter. Physicians, nurses, and hospital administrators can make maternity divisions centers of family education, as well as safe, clean quarters for delivery and mother-infant care. The mother should leave the hospital confident that her way is the best way to care for her infant.

The home adjustment period will be made much easier by proper hospital instruction allowing the family an opportunity to become completely acquainted with the infant before assuming full responsibility at home. Given an opportunity to participate, the majority of fathers obtain much pleasure from taking part in the care of the new baby. The first four to six weeks after delivery find the mothers going through a rapid endocrine readjustment. Ordinarily, in the absence of apprehension and fatigue, the return to a normal endocrine balance can be taken in stride.

Science has made childbirth safe; our educational efforts in the future should be directed not only toward increasing this margin of safety, but toward a healthy, wholesome attitude regarding reproduction and parenthood as free from fear and misunderstanding as possible.

What and How Shall We Teach Expectant Parents?

THE POINT OF VIEW OF THE PUBLIC RELATIONS DIRECTOR

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IN a half century of medical progress brimming with one lifesaving discovery after another, one discovery has gone by almost unnoticed. It is not a mold or a chemical; it is not a medical technique or a method; it cannot be seen, weighed, or measured. It is the recognition that the patient has a mind of his own and that his knowledge and attitudes may be important factors in his health and in his own medical care.

For centuries the doctor was satisfied to keep his patients ignorant. A patient with little knowledge asked a few questions and followed orders more meekly. This attitude is graphically expressed in the following verbatim opinions of doctors, as reported by Shapiro, Lifson, and Dublin:[1] "If you mean a doctor should shoulder the burden of educating his patients, I certainly don't think that is his problem at all. I definitely think it is his duty to explain to each person whatever his problem is but I don't think he is responsible for anything more than that, morally or ethically." Or, "A man who is in the practice of medicine is not a visiting nurse."

The change in this opinion has been gradual but widespread. It has been one of the causes of the rapid rise of psychosomatic medicine. It has also been partly responsible for the concept of the medical team which includes the doctor, the nurse, the technician, and the *patient*.

This session of the Congress is an indication among professionals of the growing importance of the patient's knowledge as a basic element in his care. Our previous speakers have outlined some of the facts which are important for every person to know if he or she is to be a good parent. From the side lines during the past ten years, I have observed the rapid expansion of this information for parents. First, the simplest facts were taught about baby care, about selecting the furniture, about the layette and the mother's clothes. Many nurses were perturbed because they were unable to hold the interest of their students. They should have been perturbed. Many of the mothers were bored. They wanted to know much more and they said so. Because of their demand, the expectant fathers were brought into class and the material discussed was gradually broadened until today the whole world of the family and its relationship to the community is the horizon for the teaching of parents.

I remind you again that this development occurred chiefly in response to a demand of the parents themselves. Progress in any branch of medicine or nursing is only possible when public opinion makes it possible.

The parents of today know much more about human reproduction, marital adjustments, and the importance of sound human relations in family living

than did *their* parents. This breaking of the walls of taboo and prudery must not be taken as a sign of total victory. There is a great difference between knowing the facts about reproduction and about family living and applying those facts to the habit patterns of life. Many people draw a boundary line in their minds. Often what they do does not match what they know. Action and knowledge may be in two different worlds.

The teacher of a class for expectant parents cannot feel content that the job has been done if she merely presents the facts, for a fact can be cold and impersonal. Especially in the realm of childbearing, what people know and what people do may be miles apart. It is therefore highly important for the teacher to know how the mind of a mother or father operates and to recognize that there are frequently emotional resistances to the application of known facts to the patterns of life.

Let us say that a certain mother believes pregnancy is a sickness of nine months' duration. This has been taught to her by her mother and her grandmother. It is part of her own personality which has developed from her basic family and racial culture. Even menstruation is pictured to her as a monthly sickness. She expects not to feel at her best during pregnancy and she is ready to accept her martyrdom because she wants a child.

This mother learns in mothers' class the importance of selecting a competent doctor and of having her baby in an approved hospital. Armed with these facts, she selects a physician with the highest qualifications and the best of hospital connections. Following her first prenatal examination, this doctor tells her to report any signs of illness at once.

One morning she is dizzy. She sees spots before her eyes and she has a headache. To her this is not strange because *pregnancy is a sickness of nine months' duration.* She does nothing about the symptoms, perhaps not even mentioning them to her husband. By the time she sees the doctor, her toxemia may be far advanced. Thus, the excellence of medical care provided by her doctor and the teaching in mothers' class are nullified by her hidden resistance expressed in her opinion as, "Pregnancy is a sickness of nine months' duration."

Another mother is taught the importance of a balanced diet to her and her baby's health and of increasing her intake of protein during pregnancy. The elements of this balanced diet and the sources of protein are thoroughly described by the teacher. The suggested foods which the nutritionist recommends, however, may not take into consideration the various racial likes and dislikes of different groups in the population. Let us say this mother comes from a racial group which puts special emphasis upon beans and rice. No meal would be complete without these foods. Her family would resist many of the foods suggested by the nutritionists. The information presented in good faith by the teacher is therefore not applied by the mother to her own eating habits or to the eating habits of her family. This resistance is expressed in such a simple sentence as, "We don't like it."

These inner resistances, based upon the experiences which people have in life, are expressed in terms of their opinions, which, while they may not be based upon fact, are treated as though they were fact. Shall we look at a few?

Childbearing spoils a woman's looks.
Infertility is always the woman's fault.
A nursing mother cannot conceive.
Masturbation will cause insanity.
Labor is by nature painful.
Health is not being sick. I am not sick; therefore I am not interested in learning about health.
My children are never hungry—they always have enough to eat.
Sex is dirty. Only parents should teach their

children about sex and human reproduction. This is not a function of public education. I want to keep my children innocent.

It is in these expressions, treated as though they were factual, that we discover some of the reasons why people do not always act upon the facts presented to them.

A second type of resistance to the facts may develop from the lack of a common language. I am not speaking of the difference between Spanish and English or French and Spanish, but between English and English, French and French, Spanish and Spanish. Every word in any language has two meanings, the dictionary meaning and the emotional overtones which arise from the experiences of an individual.

The reaction of a person to particular words may be determined by the emotional overtones. To the teacher the word *doctor* or *hospital* may be completely dissociated from negative or fearful emotions. But to some mothers, these words may be filled with fears and resistances. The word *doctor,* for instance, may be associated with pain because of an unfortunate or difficult experience. The doctor's white gown, his instruments, even the odor of his office may be fearful symbols. The word *hospital* may be associated with emotional resistances expressed in such terms as, "You go to the hospital to die!"

When the teacher mentions the importance of selecting the right doctor and hospital, she may be awakening resistances of great intensity. The mother, even though she knows the importance of early prenatal care, may put off seeing the doctor because of this emotional resistance. She knows in her heart of hearts that some day she will have to face the decision but she puts it off until tomorrow. She may cover up this emotional resistance by a smoke screen of rationalization. She may say, "I can't afford to see the doctor," or, "The hospital clinic is too far away," or "My family keeps me too busy," or "My husband doesn't want me to go to the doctor." The teacher may do battle with this wraith of rationalization. She may offer transportation to the hospital clinic. She may talk to the mother's husband and secure his consent, but she is wasting her time, energy, and breath. Deep in the shadows are the real resistances. Every teacher must learn to recognize that in blithely imparting information she may not be achieving one of the goals of her efforts, which is the changing of the habit patterns of her students.

The third state of resistance may arise in the minds of parents because of confusion—confusion resulting from the conflicting opinions of doctors and nurses and from the rapid about-faces of their ideas and policies. A generation ago mothers were taught that loving and cuddling were the essentials of good baby care. Then suddenly these opinions were discarded for the viewpoint of the behavioristic psychologists—for regularity of feeding, for letting the baby cry it out. The clock became the master of the nursery. No sooner had these ideas permeated to remote country crossroads when cuddling and mothering again became the essentials of good infant care. The clock was put away as the master of the baby's and family's life.

Pity the poor mother who had her babies under two regimes of infant care! For her first-born, the doctor recommended a certain pattern of behavior as a sign of being a good mother. For her second child, however, to be a good mother she had to reverse this pattern completely.

In obstetrics the same situation has prevailed. When Grandma had her baby, it was at home. She called the doctor at the last minute without having consulted him during pregnancy. There was nothing for her to get excited about—was not childbearing natural?

Having a baby at home meant that everybody shared in the excitement. Father had a real job to do helping the doctor, boiling the water, doing the errands, watching out for the other children, answering the door. He was badly needed. Most babies were breast-fed. It was a tragedy if a mother could not nurse her baby. Mother and baby roomed together and for the most part mother mothered her baby. Mother was the center of the scene during pregnancy and childbearing.

Almost overnight a revolution occurred. Home was deprecated as a place for childbearing. It was not safe. Mother and baby were separated. Breast feeding was outmoded. How revolting it was! Father was physically pushed out of the hospital. He was told to go home and wait for the news over the telephone. Mother was removed psychologically. She was merely the container for the growing baby—a walking uterus. The doctor and nurse did all the work. The mother was taught to be inert and inactive.

Another revolution occurs. Childbearing becomes a natural process again. Breast feeding is important to the baby's developing personality. Rooming the mother and baby together becomes essential to emotional security. Father is put to work again. He holds his wife's hand, he rubs her back. His loving arms help to build her emotional security. Mother again takes the center of the stage. The bricks and mortar we have erected in the form of hospitals, however, do not fit into the new pattern, nor do the minds of many doctors and nurses and many parents. The result is confusion.

Who is right? Whom to believe? From this continued about-face of the experts arises a resistance to recommendations of doctors and nurses. Their position as teacher is jeopardized. What they say today—will it be factual tomorrow? This is the question in the minds of parents, with the resultant exclamation, "So what!"

To avoid the resistances due to confusion in the minds of parents, the members of the medical team, and the teachers of parents' classes must learn to differentiate between their own opinions and the proved facts. The about-faces which take place so frequently in the basic philosophy of child care or maternity care are due to the teaching of opinions rather than the teaching of facts.

Orlansky [2] and Stendler [3] question a number of the dogmas of pediatrics and obstetrics as not being based entirely upon fact. "We know that different aspects of behavior are interrelated," says Dr. Stendler, "and that poor physical health may be caused by emotional difficulties. We know that behavior is caused and that it has its roots in early childhood experiences. We know that human beings have certain emotional needs just as they do physical needs and that these needs must be satisfied if an individual is to grow up healthy in mind and body. But the specifics of these general truths we do not know. It would seem evident that children need to feel loved to thrive but how the feeling of love is communicated to a young baby is a matter of speculation.

The feeling of affection may be keenly sensed by the child whose mother may schedule his feeding or his toilet training but whose warmhearted acceptance of him may be communicated in very subtle ways. In the same way, a feeling of rejection may be felt by a child whose mother follows the latest book and feeds on a self-demand schedule but who cuddles only from a sense of duty and not because she has any zest for the job. We cannot order or prescribe love," continues Dr. Stendler, "and when we make a dogma out of it, we may only add to the guilt feelings of those parents whose own emotional diffi-

culties keep them from wholehearted acceptance of their children."

If facts, like John Alden, do not always speak for themselves, compulsion must be added to the recipe. I would remind you, however, that there are two methods of compulsion. One is autocratic and is an external force acting upon people. The other is an inner compulsion which arises from the forces within the individual, the family, and the community. This is democratic compulsion.

The three dictators of our day have highly developed the autocratic compulsive motivation, which is based upon the conditioned reflex and upon the arousal of powerful emotions that may be entirely dissociated from the facts. Hitler, for instance, frightened his people into persecuting the Jews and preparing for war. Stalin is frightening his people into battling the "capitalistic warmongers" and preparing for war. Senator McCarthy's tactics are much the same.

This autocratic compulsiveness has been adapted by the hucksters of products. "Don't be half safe," they shout. "Beware of halitosis." "Even your best friend won't tell you." These and a host of other slogans have burgeoned in our popular press and over the radio and television.

Many health educators have fallen for this autocratic type of motivation. Millions have been frightened into contributions to fight cancer or polio or tuberculosis or virtually all the ills to which the human flesh is heir. We are raising a generation of hypochondriacs frightened by the *Boo* technique at every turn. "Do you have a lump in your breast? It may be cancer. *Boo*—run to the doctor." "Do you have a cough? It may be tuberculosis. *Boo*—get an x-ray." "Does your child have an upset stomach, a runny nose, a pain in the neck? *Boo*—it may be polio."

Yes, the dictators have always been effective. They have forced nations to goose-step and march off the cliff if need be. Dictatorial motivations have raised millions of dollars for public health, regardless of the fact that the emotional overtones which they have developed may not be conducive to health of mind or body. Said Dr. Herbert Birch, Associate Professor of Psychology of City College, New York, "This method stops people from having initiative and it tends to create a general atmosphere of people doing what they are told. You could then report that you've had a successful public health campaign, but you have destroyed or helped to destroy 7,200 brains—that is your contribution. You get people to act without understanding. You make them jump through the hoop. This method has no respect for people. It has no respect for the capacity of people to understand and to behave intelligently. It is arrogant."

As a health educator, as a believer in Democracy, I reject this autocratic method of causing people to act in the realm of politics, health, or what-have-you, even though it is effective. I reject it chiefly because it ignores the facts. Facts must always be the chief reason why people change their habits or their attitudes.

It seems to me that in education about parenthood we have more closely approximated the ideal situation in mass teaching. Yet we must learn to develop a compulsion among parents who resist applying the facts to their daiiy lives. This compulsion, however, should arise from the inner desires and inner forces which tie a family together and a family to the community. Perhaps a single most important factor in democratic compulsion is the recognition that no person stands by himself. Lewin[4] declares that the ground upon which an individual stands is the group. Each person is subject to the pressures within the group and gets his security from the group. This may be his family, his

church, his business organization, his club, his nation, his world! From these groups arise economic, emotional, political, and personal pressures which often cause him to act differently than would the resistances which are in his mind.

A wise teacher attaches great importance to weaving the facts of the syllabus into the vital group forces which are important in the lives of expectant parents.

The resistances which deter a mother from applying facts about good nutrition to her own and her family's diet may be broken down by the relation of those facts to her love of her coming baby. Perhaps never will she listen more receptively. The mother who does not apply her knowledge about a balanced diet because the practical suggestions of nutritionists do not conform to her family's eating habits which are based upon age-old cultures may be decidedly interested if these suggestions conform to the cultural likes and dislikes and the methods of preparing food which are part of her family's heritage. Margaret Mead [5] has pointed out that many people eat certain foods because "they like the food and the food likes them."

Fear of the hospital, which may color a mother's attitude during all of pregnancy and labor, may be dissipated by a come-and-see tour. Where the mother has an opportunity to inspect the labor and delivery rooms of a hospital and to meet the people who will care for her, she finds a friendly acceptance of herself by this group an open door to true expectancy and to a reduction in the anxieties which may have beset her.

The facts about breast feeding which may have met a stone wall of resistance in the mind of a mother may be readily accepted if she learns that nursing her baby will not spoil her figure. Her desire for beauty and for her husband's admiration may be stronger than the facts about nutrition, immunity, or emotional stability for her baby.

The mother who is prepared to call for complete oblivion during labor may change her mind when she knows that she will have the security of her husband by her side and when labor is presented as a challenge to her womanhood, when parturition is depicted as a full expression of her unique function as a woman. Thus, she develops a confidence in herself and a pride in her ability. She looks forward to joy and exaltation at the moment of the actual birth of her baby and this carries her through the difficult times of her labor.

In these illustrations of motivation, we see the inner forces at the very basis of human life being mobilized to change logic-proof resistances. These are the forces of love for one's husband, for one's child, acceptance by the community and by the groups with which a person is identified.

Perhaps most effective of all internal compulsion is the development of the team concept, in which the mother and father play an active role with the doctor, nurse, and other professionals. As professionals and parents work together, they experience a spiritual amalgam. The doctor and nurse obtain a greater sense of satisfaction. The parents learn how knowledge can build within themselves a feeling of supreme confidence in their ability to have their babies according to nature's plan in which they do the work and reap the reward.

If the facts we teach seem cold and remote, the teacher has not caught the vision of their broader significance. For perhaps to no group in the world is the future more deeply entrusted than to those who are working at the very center of the growth and progress of society, at the very basis of the family and the family's relationship to the community, the nation, and the world. What kind of people spring out of the world's families in the next twenty years will be an important factor in the future of mankind. Yes, it is a broad vista, indeed.

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